

Seismic Retrofit Project



STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**NOTICE TO CONTRACTORS
AND
SPECIAL PROVISIONS**

**FOR CONSTRUCTION ON
STATE HIGHWAY**

IN

**THE CITY AND COUNTY OF SAN FRANCISCO
AT YERBA BUENA ISLAND TUNNEL APPROACH (WEST
VIADUCT)**

DISTRICT 04, ROUTE 80

For use in Connection with Standard Specifications **DATED JULY, 1992**, Standard Plans **DATED JULY, 1992**, and Labor Surcharge And Equipment Rental Rates.

CONTRACT NO. 04-043474

INFORMAL BIDS CONTRACT

04-SF-80-7.5/7.7

Bids Open: May 5, 1998

Dated: March 23, 1998

OSD

DEPARTMENT OF TRANSPORTATION

ESC/OE MS #43

P.O. Box 942874

SACRAMENTO, CA 94274-0001



TDD (916) 654-4014

April 22, 1998

04-SF-80-7.5/7.7

04-043474

Addendum No. 2

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in THE CITY AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND TUNNEL APPROACH (WEST VIADUCT).

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on May 5, 1998.

This addendum is being issued to revise the Project Plans, the Notice to Contractors and Special Provisions, and the Engineer's Estimate.

Project Plan Sheets 15A, 25, 26 and are revised. Half-sized copies of the revised sheets are attached for substitution for the like numbered sheets.

Project Plan Sheet 26A is added. A half-sized copy of the added sheet is attached for addition to the project plans.

On Project Plan Sheets 35, 40, 42 and 45 under "Symbols" the reference to Stage 2 is revised to Stage 3.

In the Special Provisions, Section 4, "Beginning Of Work, Time Of Completion And Liquidated Damages" the third and fourth paragraphs are revised as follows:

"This work shall be diligently prosecuted to completion before expiration of

280 WORKING DAYS

beginning at 12:01 a.m. on the **FIRST WORKING DAY AFTER CONTRACT AWARD.**

The Contractor shall pay to the State of California the sum of \$2000 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above. The 72 hours advance notice before beginning work as referred to in said Section 8-1.03 is changed to 24 hours advance notice for this project."

In the Special Provisions, Section 5.1.18 "Payments", item Electronic Mobile Daily Diary Computer System \$63,000 is deleted.

In the Special Provisions, Section 5.1.22 "Electronic Mobile Daily Diary Computer System" is deleted.

In the Special Provisions, Section 5.1.23 "Electronic Mobile Daily Diary System Data Delivery" the third paragraph is revised as follows:

"This personnel information will only be used with a State mobile daily diary computer system and it will not relieve the Contractor and subcontractors from all the payroll records requirements as required by Section 7-1.01A(3), "Payroll Records," of the Standard Specifications."

In the "Copy of Engineer's Estimate" in the NOTICE TO CONTRACTORS and the "Engineer's Estimate" in the PROPOSAL, Items 13, 14, 19, 21, 70, 71 and 72 are revised and Items 2 and 6 are deleted as attached.

To Proposal and Contract book holders:

- REPLACE THE ENTIRE ENGINEER'S ESTIMATE IN THE PROPOSAL WITH THE ATTACHED ENGINEER'S ESTIMATE. THE REVISED ENGINEER'S ESTIMATE IS TO BE USED IN THE BID SUBMITTAL AND INSERTED IN THE PROPOSAL.
- INDICATE RECEIPT OF THIS ADDENDUM BY FILLING IN THE NUMBER OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE SIGNATURE PAGE OF THE PROPOSAL.
- Submit bids in the Proposal and Contract book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.
- Inform subcontractors and suppliers as necessary.

This office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it.

If you are not a Proposal and Contract book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

ORIGINAL SIGNED BY

NICK YAMBAO, Chief
Plans, Specifications &
Estimates Branch
Office of Office Engineer

Attachments

ENGINEER'S ESTIMATE**04-043474**

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	010187	REMOVE STANDARD HI-DRO CRASH CUSHION	EA	1		
2	BLANK					
3	012172	ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY	LS	LUMP SUM	LUMP SUM	
4	011835	TIME RELATED OVERHEAD	WDAY	220		
5	070010	PROGRESS SCHEDULE (CRITICAL PATH)	LS	LUMP SUM	LUMP SUM	
6	BLANK					
7	072006	TEMPORARY SUPPORT	LS	LUMP SUM	LUMP SUM	
8	047057	TEMPORARY DECK BRIDGING	LS	LUMP SUM	LUMP SUM	
9	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
10	074020	WATER POLLUTION CONTROL	LS	LUMP SUM	LUMP SUM	
11 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
12 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
13	120165	CHANNELIZER (SURFACE MOUNTED)	EA	28		
14	129000	TEMPORARY RAILING (TYPE K)	LF	830		
15	129100	TEMPORARY CRASH CUSHION MODULE	EA	8		
16	150206	ABANDON CULVERT	EA	6		
17	012176	ABANDON VAULT	EA	1		
18	150227	ABANDON PIPELINE	LF	300		
19	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	6,030		
20	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	1,530		

ENGINEER'S ESTIMATE

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	150722	REMOVE PAVEMENT MARKER	EA	2,750		
22	150806	REMOVE PIPE	LF	4		
23	150820	REMOVE INLET	EA	3		
24	150846	REMOVE CONCRETE PAVEMENT	CY	24		
25	152320	RESET ROADSIDE SIGN	EA	1		
26	012177	MODIFY WATER AND AIR LINES (BRIDGE)	LS	LUMP SUM	LUMP SUM	
27	153210	REMOVE CONCRETE	CY	38		
28	153221	REMOVE CONCRETE BARRIER	LF	250		
29	012178	REMOVE CRASH CUSHION PANELS AND CELLS	LF	180		
30	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
31	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	
32 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	150		
33 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	380		
34	390101	ASPHALT CONCRETE	TON	46		
35	401000	CONCRETE PAVEMENT	CY	24		
36 (S)	500060	TIEDOWN ANCHOR	EA	40		
37 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	202		
38 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	232		
39 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	3.3		
40 (F)	012559	MINOR CONCRETE (MINOR STRUCTURE) (HAZARDOUS MATERIAL)	CY	11		

ENGINEER'S ESTIMATE

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	510522	MINOR CONCRETE (PIPE COVER)	CY	13		
42	510526	MINOR CONCRETE (BACKFILL)	CY	4.6		
43	047058	DRILL AND PRESSURE GROUT	LF	150		
44	511106	DRILL AND BOND DOWEL	LF	170		
45 (S)	515063	CORE CONCRETE (4")	LF	6		
46 (S)	515065	CORE CONCRETE (6")	LF	48		
47 (S)	515067	CORE CONCRETE (8")	LF	4		
48 (S)	515068	CORE CONCRETE (9")	LF	14		
49 (S)	012179	CORE CONCRETE (20")	LF	2		
50	519080	JOINT SEAL	LF	76		
51 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	102,500		
52 (S)	590135	SPOT BLAST CLEAN AND PAINT UNDERCOAT	SQFT	25		
53 (S)	590301	WORK AREA MONITORING	LS	LUMP SUM	LUMP SUM	
54	012560	18" REINFORCED CONCRETE PIPE (HAZARDOUS MATERIAL)	LF	210		
55	012561	6" CORRUGATED STEEL PIPE (.079" THICK) (HAZARDOUS MATERIAL)	LF	12		
56	012562	18" CORRUGATED STEEL PIPE (.109" THICK) (HAZARDOUS MATERIAL)	LF	150		
57	012180	6" STEEL PIPE DOWNDRAIN	LF	24		
58	012563	36" CORRUGATED STEEL PIPE INLET (.138" THICK) (HAZARDOUS MATERIAL)	LF	16		
59	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	12		
60 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	LB	6,550		

REVISED PER ADDENDUM NO. 2 DATED APRIL 22, 1998

ENGINEER'S ESTIMATE**04-043474**

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (S-F)	750498	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	LB	1,440		
62 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	47,500		
63	012564	6" CAST IRON PIPE (HAZARDOUS MATERIAL)	LF	4		
64 (S)	800360	CHAIN LINK FENCE (TYPE CL-6)	LF	650		
65 (S)	802520	6' CHAIN LINK GATE (TYPE CL-6)	EA	2		
66 (S)	012182	CRASH CUSHION (HI-DRO SANDWICH SYSTEM)	EA	1		
67	012183	CONCRETE BARRIER (TYPE 60C MODIFIED)	LF	250		
68	012184	CONCRETE BARRIER (TYPE 60D MODIFIED)	LF	180		
69 (S)	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	4,080		
70 (S)	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	13,680		
71 (S)	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	2,060		
72 (S)	850102	PAVEMENT MARKER (REFLECTIVE)	EA	700		
73 (S)	912185	SEISMIC RETROFIT (ELECTRICAL FACILITIES)	LS	LUMP SUM	LUMP SUM	
74	192023	STRUCTURE EXCAVATION (TYPE H)	CY	370		
75	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID: _____

DEPARTMENT OF TRANSPORTATION

ESC/OE MS #43

P.O. Box 942874

SACRAMENTO, CA 94274-0001



TDD (916) 654-4014

April 16, 1998

04-SF-80-7.5/7.7

04-043474

Addendum No. 1

Dear Contractor:

This addendum is being issued to the contract for construction on State highway in THE CITY AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND TUNNEL APPROACH (WEST VIADUCT).

Submit bids for this work with the understanding and full consideration of this addendum. The revisions declared in this addendum are an essential part of the contract.

Bids for this work will be opened on May 5, 1998.

This addendum is being issued to revise the Project Plans, the Notice to Contractors and Special Provisions, and the Engineer's Estimate.

Project Plan Sheets 4, 15, 16, 33, 34, 35, 46, 49, 50, 51, 67, 68, 77, 85, 93, 94, 95, 96, 97, 101 and 104. are revised. Half-sized copies of the revised sheets are attached for substitution for the like numbered sheets.

Project Plan Sheet 15A is added. A half-sized copy of the added sheet is attached for addition to the project plans.

On Project Plan Sheet 63, the quantity for Structure Excavation (Bridge) is revised as follows:

"Structure Excavation (Bridge) 150 CY"

On Project Plan Sheet 63, a quantity for Structure Excavation (Type H) is added as follows:

"Structure Excavation (Type H) 370 CY"

In the Notice To Contractors, the following paragraphs are added after the fifth paragraph:

"Bidder inquiries may be made as follows:

Toll Bridge Retrofit Program Duty Senior at District 04 Office, 111 Grand Avenue, Oakland, California 94612; Fax Number (510) 286-4563, e-mail ybermude@trmx3.dot.ca.gov, telephone number (510) 286-5549.

Bidders will be requested to submit their inquiries in writing to the Oakland address, accompanied by an electronic copy where feasible, in order to avoid any misunderstandings. Written inquiries shall include the bidder's name, address and phone number. Written inquiries will be investigated and an addendum to the contract will be issued to the extent feasible and at the discretion of the Department. A copy of each addendum will also be posted on the Internet at <http://tresc.dot.ca.gov/YBAPPROACHinquiry.html>."

In the Special Provisions, Section 2-1.07, "Escrow Of Bid Documentation" is added as attached.

In the Special Provisions, Section 5-1.16, "Subcontracting" the following paragraph is added after the first paragraph:

"The first sentence in the third paragraph of said Section 8-1.01 is amended to read:

The Contractor shall perform with his own organization contract work amounting to not less than 30 percent of the original total contract price, except that any designated "Specialty Items" may be performed by subcontract and the amount of such "Specialty Items" so performed may be deducted from the original total contract price before computing the amount of work required to be performed by the Contractor with his own organization."

In the Special Provisions, Section 5-1.18, "Payments" the following item of the second paragraph is revised as follows:

"Electronic Mobile Daily Diary Computer System \$ 70,000"

In the Special Provisions, Section 5-1.18, "Payments" the following paragraph is added after the third paragraph:

"Structural steel fabricated and stored outside of the State of California or the United States will be eligible for partial payment if the Contractor furnishes evidence satisfactory to the Engineer that its storage is subject to or under the control of the Department and that it has been fabricated specifically for this project and is of such character that is not adaptable to any other use."

In the Special Provisions, Section 5-1.20, "Relations With United States Navy" the second paragraph is revised as follows:

"Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, P. O. Box 942874, Sacramento, California 94274-0001, Telephone No. (916) 654-4490, and are available for inspection at the office of the Toll Bridge Program Duty Senior's Desk at 111 Grand Avenue, Oakland, California 94601. Please call the Toll Bridge Program Duty Senior, Telephone No. (510) 286 - 5549, to reserve a copy at least 24 hours in advance."

In the Special Provisions, Section 5-1.21, "Contaminated And Hazardous Material, General" the second paragraph is revised as follows:

"Contaminated and hazardous material have been discovered through testing within the project limits. Portions of the test results are included in the "Materials Information." The complete report entitled "Subsurface Soil Investigation San Francisco - Oakland Bay Bridge/Yerba Buena Island" is available for inspection at the Toll Bridge Program Duty Senior's Desk, 111 Grand Avenue, Oakland, California, (510) 286-5549. The levels of contaminants in material designated as hazardous in the plans or in these special provisions characterize the material as hazardous waste as defined by State of California regulations. The materials are not regulated under the federal Resource Conservation and Recovery Act (RCRA). The levels of contaminants in material designated as contaminated in the plans or these special provisions characterize the material as nonhazardous waste as defined by State of California regulations."

In the Special Provisions, Section 5-1.22, "Electronic Mobile Daily Diary Computer System" the following paragraphs are added after the third paragraph:

"The equipment and software component must be in current operation for at least one year for a paying customer before bid opening; the paying customer must be external to the bidder's organization (not owned by the bidder and not owning the bidder); and, use of the equipment or software in current operation must substantially conform to these special provisions.

In providing verification of compliance with this Customer In-use requirements, the bidder must provide the name and address of customer installations and the name and telephone number of a contact person for each installation."

In the Special Provisions, Section 5-1.22, "Electronic Mobile Daily Diary Computer System" subsection "Hardware Requirements" the second paragraph is revised as follows:

"The Contractor shall supply hardware for the system in the following quantities:

- 10 – PDA and accessories as described above.
- 01– desktop workstations as described above.
- 01– printers as described above.
- as need it – misc. network hardware and cables as described above.
- 03 – PDA keyboards.
- 03 – PDA print packs.
- 10– Oracle Workgroup Server licenses.
- 20 - WriteRight screen enhancers.
- 20 - Replacement styluses for PDAs."

In the Special Provisions, Section 5-1.25, "Utilities" the first paragraph is deleted.

In the Special Provisions, Section 5-1.28, "Access To Jobsite" the first paragraph is revised as follows:

"Prospective bidders may make arrangements to visit the jobsite by contacting the Toll Bridge Program Duty Senior's Desk, Telephone No. (510) 286 - 5549."

In the Special Provisions, Section 5-1.29, "Drawings" the following paragraphs are added after the third paragraph:

"At the completion of the contract, one set of all approved final working drawings in electronic form, including any revisions required after approval, shall be furnished to the Engineer.

Electronic files of working drawings shall be Microstation Version 5.0 or a more current design file format and shall be submitted on compact disk media.

An index prepared specifically for the working drawings for each portion of the work which requires working drawings, containing sheet numbers and titles shall be included on the compact disk media. Electronic files for working drawings shall be arranged in the order of drawing numbers shown in the index."

In the Special Provisions, Section 10-1.03, "Cooperation" the subparagraph for Contract No. 04-043544 of the third paragraph is revised as follows:

"Contract No. 04-043544. Work is located at the West Bay Bridge Caissons and at Piers W2 and W6. Construction is scheduled to begin in Summer 1998."

In the Special Provisions, Section 10-1.03, "Cooperation" the subparagraphs for Contract Nos. 04-043564 and 04-043574 are replaced with the following subparagraph:

"Contract No. 04-0435U4. Work is located on Route 80 on the San Francisco-Oakland Bay Bridge from the San Francisco Anchorage to the Yerba Buena Anchorage including Pier W2 through Pier W6. This project is a seismic retrofit of the anchorages. Construction is scheduled to begin in Fall 1998."

In the Special Provisions, Section 10-1.04, "Progress Schedule (Critical Path)" subsection "Equipment and Software" the following item is added:

"7) HP LaserJet 5-series or 100% compatible."

In the Special Provisions, Section 10-1.08, "Maintaining Traffic" the second, third, tenth and seventeenth paragraphs are deleted.

In the Special Provisions, Section 10-1.08, "Maintaining Traffic" the following paragraphs are added after the seventeenth paragraph:

"NOTIFICATION OF ALTERED HORIZONTAL AND VERTICAL CLEARANCES

The Contractor shall provide the Engineer with a 21 day written notice prior to making any temporary or permanent changes at the work site that will affect existing horizontal and vertical clearances on any highway, freeway, ramp, connector, utility or railroad facility. The notice shall be in sufficient detail to show existing and proposed measurements of the alteration and the location where the measurements were taken. Within 24 hours after a change, the Contractor shall provide the Engineer with a written notice indicating the actual horizontal and/or vertical clearances as changed. The above notification requirements includes the removal of any temporary conditions or restrictions affecting horizontal and vertical clearances.

Temporary changes having an effect on horizontal and vertical clearances include, but are not limited to: installation of falsework, temporary bridges and pedestrian walkways; placement of temporary detours with vertical grade changes and structures, concrete barriers (K-rail, including glare screen if applicable) encroaching on a lane, shoulder, ramp or connector widths; lane shifts or widening; detours, and closure or realignment of ramps.

Permanent clearance alterations include, but are not limited to pavement overlays under structures; erection of new sign structures, or modifications to existing sign structures; seismic retrofit modifications over the traveled way; and, construction of new structures.

This requirement is separate and in addition to the requirements of "Closure Scheduling and Notification" included in this section of the special provisions. Failure to comply with these requirements will result in denied closures and no compensation will be allowed therefore.

Compensation for compliance with notification requirements

Full compensation for conforming to the requirements of this section and its notification requirements is included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

CLOSURE SCHEDULING AND NOTIFICATION

For the purposes and intent of this provision and unless the context requires otherwise, the terms Closure, Lane Closure, and shoulder closure or pronouns in place of them, shall be interpreted as "any and all lane, ramp, connector and other types of closures on the main line with potential to impact the traveled way or public traffic". All proposed closures shall be subject to scheduling, notification and approvals on a weekly basis (Monday through Sunday cycle).

Contractor required submittals

On or before each Monday at noon, the Contractor shall furnish to the Engineer a written schedule of all closures for the two weeks period beginning the following Monday and ending on a Sunday two weeks later. This schedule will identify: one week in advance, all proposed closures required in the performance of contract work (Week 1) and; two weeks in advance, all planned closures required in the performance of contract work (Week 2). Closures identified in Week 2 of the schedule shall be used for planning purposes and will form the basis for establishing closure entries in Week 1 of the following week's submittal.

The written schedule for Week 1 shall show locations and times when the proposed closures are to be in effect. The Contractor will be provided with copies of "Closure Request Form" (form 4CD-170) for scheduling any closure identified in Week 1. Closure requests submitted with incomplete, unintelligible or inaccurate information will be returned for correction. The Contractor will be notified in writing of approval or denial of the submitted closure scheduling no later than 3:00 p.m., Thursday

of the week preceding the scheduled work. The Contractor will also be notified whenever California Highway Patrol (CHP) assistance is scheduled in conjunction with approved lane closure schedules.

Changes and Cancellations

Changes, including cancellations, to a previously submitted Week 1 schedule, proposed by the Contractor, shall be submitted to the Engineer for approval at least 72 hours prior to the time when the closure was to be in place. The written notice to the Engineer of changes to any closure shall be made during normal office hours between the hours of 7:00 a.m. and 4:00 p.m., Monday through Friday, excluding designated legal holidays. The Contractor shall allow a minimum of 24 hours for the Engineer to review and approve / disapprove the requested changes. A revised request may be submitted for consideration of rescheduling of closures during the week, for work that is postponed due to weather or circumstances, beyond the control of the Contractor, which impacts the previously approved schedule.

Contractor requested changes to the previously approved Week 1 closure schedule not conforming to the above requirements will be reviewed at the Engineer's earliest convenience and approval is not guaranteed. No compensation will be allowed for denied closures due to Contractor initiated changes or cancellations due to weather or circumstances within the control of the Contractor.

Changes or cancellations to the previously submitted Week 1 schedule or approved closures for which less than 72 hours notice is provided, will result in an administrative charge to the contractor of \$250.00 per changed or canceled closure, up to a maximum of \$1000.00 per day.

For approved closures with work involving California Highway Patrol (CHP) assistance, changes or cancellations with less than 36 hours notice may result in charges to the Department. In such cases, the Contractor will be charged for all costs resulting from late changes or cancellations. These costs will be a minimum of \$50.00 per scheduled CHP officer to a maximum 4 hours of overtime pay per scheduled CHP officer plus vehicle mileage and other costs directly related to the performance of the requested CHP assistance. In no case shall these charges exceed \$750.00 per day, per incident.

All charges attributable to changes and cancellations of previously approved closures are accumulative and in addition to any other deductions made under the contract. The Department will deduct these amounts from any moneys due, or that may become due the Contractor under the contract. Cancellations due to weather or circumstances, beyond the control of the Contractor, are exempt from these charges.

Whenever a closure is requested in accordance with the provisions of this section and if there is a delay by the Engineer in approving / disapproving requested closures, as stated herein, and the Contractor is unable to begin work at the scheduled time, the Contractor will be compensated for the cost of the interruption to the Contractor's operations as specified in "Compensation Adjustments for Denied and Aborted Closures." Failure to comply with these requirements will result in denied closures and no compensation will be allowed therefore.

COMPENSATION FOR COMPLIANCE WITH CLOSURE SCHEDULING AND NOTIFICATION REQUIREMENTS

Full compensation for conforming to the requirements of this section is included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

WORK PLAN

Whenever the Contractor's operations require any closure, the Contractor shall furnish for the Engineer's approval, a work plan of the planned operations no later than 14 days prior to the date of the scheduled work. The work plan shall be in sufficient detail to identify all items of work, quantity, sequence, timing of operations and a list of equipment that will be used. In addition, the work plan shall contain a contingency plan as described below.

CONTINGENCY PLAN

In conjunction with the work plan specified above, the Contractor shall provide the Engineer a contingency plan for removing any and all closures in the event of an equipment breakdown, shortage of or lack of production of materials or any other production failure which would otherwise delay opening the closure within the time limits specified on the "Lane Requirements and Hours of Work" included in this section "Maintaining Traffic" or at any time it becomes necessary to open the closure for use by public traffic due to congested conditions or for any other reason as determined by the Engineer. The contingency plan shall include, as a minimum, a list of equipment that will be used including any standby equipment and stockpiled materials that can be utilized for the immediate removal of closures, when ordered by the Engineer.

The Contractor shall allow 7 days, from the date of submittal, for the Engineer to review and accept or return for correction any work or contingency plan submitted. The Contractor shall not proceed with work operations requiring a Lane Closure (s) or any other operation that impacts public traffic without an approved, viable Work Plan and Contingency Plan. Acceptance of the work plan and contingency plan by the Engineer shall not relieve the Contractor from the requirement of opening the lane, connector or ramp closure for the safe and efficient operation of public traffic, as specified in the "Lane Requirements and Hours of Work" included in this section of the special provisions.

At any time a closure is made for construction operations in accordance with the provisions of this section and it becomes necessary to open the closure for use by public traffic due to congested conditions or for any other reason as determined by the Engineer, the Contractor shall immediately commence operations to remove a closure in accordance with the approved contingency plan specified herein.

Full compensation for providing the work plan and the contingency plan, implementing the plans, furnishing, placing and removal of any temporary materials regardless of how many times it is required, shall be considered as included in the contract price paid for the various items of work requiring lane, connector and ramp closures and no additional compensation will be allowed. Failure to comply with these requirements will result in denied closures and no compensation will be allowed therefore.

Compensation adjustments for delayed, denied or aborted closures

If the Contractor is ordered by the Engineer, in writing, to remove a closure originally established in accordance with these provisions, or there is a delay by the Engineer in processing requested closures or contingency plans in accordance with these provisions and the Contractor is unable to begin work at the scheduled time, the Contractor will be compensated for the cost of the interruption to the Contractor's operations as follows:

The Contractor will be granted an extension of time commensurate with the delay in accordance with the provisions of Section 8-1.07, "Liquidated Damages," of the Standard Specifications and the "Progress Schedule (Critical Path)" section of these Special Provisions.

The Contractor will be compensated for the idle time of forces and equipment and any additional costs involved in rescheduling and moving of equipment in accordance with the provisions of Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

DAMAGES

In the event that the Contractor fails to remove the lane, connector and ramp closures at the times specified on the "Lane Requirements and Hours of Work" included in this section "Maintaining Traffic", the State will deduct an monetary amount for the delay. It is expressly agreed by the parties that these specific damages to public traffic are uncertain and cannot be ascertained with any degree of accuracy and that, therefore, they are liquidated damages established and agreed upon as payment for the delay at the time of entering the contract.

For each 10 minute period, or fraction thereof, that the lanes, ramps and shoulder closures are not available for use by public traffic by the times specified, the State will deduct \$ 7,700 up to a maximum of \$139,000 per day, per incident. These deductions by the State will be cumulative with each location

or operation involved. The Department will deduct those amounts from any moneys due, or that may become due the Contractor under the contract."

In the Special Provisions, Section 10-1.13, "Existing Highway Facilities" the following paragraph is added after the second paragraph:

"Additional miscellaneous reports and documents, including but not limited to design and maintenance investigations, original and supplemental bridge reports, resident engineers reports, construction photographs, maintenance repairs, fender, and barrier rail modifications, that may be reviewed and copied, are available at the Toll Bridge Seismic Retrofit Program Duty Senior's Desk, at 111 Grand Avenue, Oakland, California, (510) 286-5549."

In the Special Provisions, Section 10-1.13J, "Temporary Supports" the last sentence of the fifth paragraph is revised as follows:

"The number of sets of drawings and design calculations for temporary supports shall be the same as specified for falsework working drawings in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications. The time to be provided for the Engineer's review of the working drawings for temporary supports shall be 5 weeks."

In the Special Provisions, Section 10-1.33, "Miscellaneous Iron And Steel" the following paragraph is added after the fifth paragraph:

"Full compensation for concrete base for the electrical conduit protective cage shall be considered as included in the contract price paid per pound for miscellaneous iron and steel and no separate payment will be made therefor."

In the "Copy of Engineer's Estimate" in the NOTICE TO CONTRACTORS and the "Engineer's Estimate" in the PROPOSAL, Items 32, 60 and 74 is revised, Item 75 is added as attached.

To Proposal and Contract book holders:

- REPLACE PAGES 4, 5 AND 6 OF THE ENGINEER'S ESTIMATE IN THE PROPOSAL WITH THE ATTACHED REVISED PAGES 4, 5 AND 6 OF THE ENGINEER'S ESTIMATE. THE REVISED ENGINEER'S ESTIMATE IS TO BE USED IN THE BID SUBMITTAL AND INSERTED IN THE PROPOSAL.
- INDICATE RECEIPT OF THIS ADDENDUM BY FILLING IN THE NUMBER OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE SIGNATURE PAGE OF THE PROPOSAL.
- Submit bids in the Proposal and Contract book you now possess. Holders who have already mailed their book will be contacted to arrange for the return of their book.
- Inform subcontractors and suppliers as necessary.

This office is sending this addendum by UPS overnight mail to Proposal and Contract book holders to ensure that each receives it.

If you are not a Proposal and Contract book holder, but request a book to bid on this project, you must comply with the requirements of this letter before submitting your bid.

Sincerely,

ORIGINAL SIGNED BY

NICK YAMBAO, Chief
Plans, Specifications &
Estimates Branch

Attachments

2-1.07 ESCROW OF BID DOCUMENTATION

Bid documentation shall consist of all documentary and calculated information generated by the Contractor in preparation of the bid. The bid documentation shall conform to the requirements in these special provisions, and shall be submitted to the Department and held in escrow for the duration of the contract.

In the resolution of disputes involving the project, the escrowed bid documents will be the only documents accepted from the Contractor regarding preparation of the bid.

In signing the proposal, the bidder certifies that the material submitted for escrow constitutes all the documentary information used in preparation of the bid and that he has personally examined the contents of the container and that they are complete.

The bidder shall include with the proposal, the identification of the bidder's representative authorized to present the bid documentation and the persons responsible for preparing the bidder's estimate.

Nothing in the bid documentation shall be construed to change or modify the terms or conditions of the contract.

Escrowed bid documentation will not be used for pre-award evaluation of the Contractor's anticipated methods of construction, nor to assess the Contractor's qualifications for performing the work.

Bid documentation shall clearly itemize the Contractor's estimated costs of performing the work. The documentation submitted shall be complete and so detailed as to allow for an in-depth analysis of the Contractor's estimate.

The bid documentation shall include, but not be limited to: quantity takeoffs; rate schedules for the direct costs and the time- and nontime-related indirect costs for labor (by craft), plant and equipment ownership and operation, permanent and expendable materials, insurance and subcontracted work; estimated construction schedules, including sequence and duration and development of production rates; quotations from subcontractors and suppliers; estimates of field and home office overhead; contingency and margin for each contract item of work; and other reports, calculations and information used by the bidder to arrive at the estimate submitted with the proposal.

The Contractor shall also submit bid documentation for each subcontractor whose total subcontract exceeds \$250,000. Subcontractor bid documentation shall be enclosed with the Contractor's submittal. The examination of subcontractors' bid documentation will be accomplished in the same manner as for the Contractor's bid documentation. If a subcontractor is replaced, bid documentation for the new subcontractor shall be submitted for review and escrow before authorization for the substitution will be granted. Upon request of a subcontractor, the bid documentation from that subcontractor shall be reviewed only by the subcontractor and the Department.

If the bidder is a joint venture, the bid documentation shall include the joint venture agreement, the joint venture estimate comparison and final reconciliation of the joint venture estimate.

Copies of the proposals submitted by the first, second and third low bidders will be provided to the respective bidders for inclusion in the bid documentation to be escrowed.

The first, second, and third apparent low bidders shall present the bid documentation for escrow at the District 04 Office, 111 Grand Avenue, Room 12-816, Oakland, CA, on the first Monday, at 1:00 p.m., following the time indicated in the "Notice to Contractors" for the opening of bids.

Bid documentation shall be submitted in a sealed container, clearly marked with the bidder's name, date of submittal, project contract number and the words, "Bid Documentation for Escrow."

Failure to submit the actual and complete bid documentation as specified herein within the time specified shall be cause for rejection of the proposal.

Upon submittal, the bid documentation of the apparent low bidder will be examined and inventoried by the duly designated representatives of the Contractor and the Department to ensure that the bid documentation is authentic, legible, and in accordance with the terms of this section "Escrow of Bid Documentation." The examination will not include review of, nor will it constitute approval of, proposed construction methods, estimating assumptions or interpretation of the contract. The examination will not alter any conditions or terms of the contract. The acceptance or rejection by the Department that the submitted bid documents are in compliance with this section "Escrow of Bid Documentation" shall be completed within 48 hours of the time the bid documentation is submitted by the Contractor.

At the completion of the examination, the bid documents will be sealed and jointly deposited at an agreed commercial bank.

Bid documentation submitted by the second and third apparent low bidders will be jointly deposited at agreed commercial banks. If the apparent low bid is withdrawn or rejected, the bid documentation of the second low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. If the second low bid is withdrawn or rejected, the bid documentation of the third low bidder will be examined and inventoried in the manner specified above, then sealed and deposited again in escrow. Upon execution and final approval of the contract or rejection of all bids, the bid documentation will be returned to any remaining unsuccessful bidders.

The escrowed bid documentation may be examined by the designated representatives of both the Department and the Contractor, at any time deemed necessary by either the Department or the Contractor to assist in the negotiation of price adjustments and change orders, or in the settlement of claims or disputes.

CONTRACT NO. 04-043474
REVISED PER ADDENDUM NO. 1 DATED APRIL 16, 1998

If requested by a Disputes Review Board, the escrowed bid documentation may be utilized to assist the Board in its recommendations.

The bid documentation submitted by the Contractor will be held in escrow until the contract has been completed, the ultimate resolution of all disputes and claims has been achieved and receipt of final payment has been accepted by the Contractor. The escrowed bid documentation will then be released from escrow to the Contractor.

The bid documentation submitted by the bidder is, and shall remain, the property of the bidder, and is subject to only joint review by the Department and the bidder. The Department stipulates and expressly acknowledges that the submitted bid documentation constitutes trade secrets and will not be deemed public records. This acknowledgment is based on the Department's express understanding that the information contained in the bid documentation is not known outside the bidder's business, is known only to a limited extent and only by a limited number of employees of the bidder, is safeguarded while in the bidder's possession, is extremely valuable to the bidder and could be extremely valuable to the bidder's competitors by virtue of it reflecting the bidder's contemplated techniques of construction. The Department acknowledges that the bid documentation includes a compilation of information used in the bidder's business, intended to give the bidder an opportunity to obtain an advantage over competitors who do not know of or use the contents of the documentation. The Department agrees to safeguard the bid documentation, and all information contained therein, against disclosure, including disclosure of subcontractor bid documentation to the Contractor and other subcontractors to the fullest extent permitted by law. However, in the event of arbitration or litigation, the bid documentation shall be subject to discovery, and the Department assumes no responsibility for safeguarding the bid documentation unless the Contractor has obtained an appropriate protective order issued by the arbitrator or the court.

Full compensation for preparing the bid documentation, presenting it for escrow and reviewing it for escrow and upon request of the Engineer shall be considered as included in the contract prices paid for the various items of work, and no additional compensation will be allowed therefor.

The direct cost of depositing the bid documentation in escrow at the agreed commercial bank will be paid by the State.

REVISED PER ADDENDUM NO. 1 DATED APRIL 16, 1998

ENGINEER'S ESTIMATE

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	150722	REMOVE PAVEMENT MARKER	EA	2,070		
22	150806	REMOVE PIPE	LF	4		
23	150820	REMOVE INLET	EA	3		
24	150846	REMOVE CONCRETE PAVEMENT	CY	24		
25	152320	RESET ROADSIDE SIGN	EA	1		
26	012177	MODIFY WATER AND AIR LINES (BRIDGE)	LS	LUMP SUM	LUMP SUM	
27	153210	REMOVE CONCRETE	CY	38		
28	153221	REMOVE CONCRETE BARRIER	LF	250		
29	012178	REMOVE CRASH CUSHION PANELS AND CELLS	LF	180		
30	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
31	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	
32 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	150		
33 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	380		
34	390101	ASPHALT CONCRETE	TON	46		
35	401000	CONCRETE PAVEMENT	CY	24		
36 (S)	500060	TIEDOWN ANCHOR	EA	40		
37 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	202		
38 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	232		
39 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	3.3		
40 (F)	012559	MINOR CONCRETE (MINOR STRUCTURE) (HAZARDOUS MATERIAL)	CY	11		

ENGINEER'S ESTIMATE

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	510522	MINOR CONCRETE (PIPE COVER)	CY	13		
42	510526	MINOR CONCRETE (BACKFILL)	CY	4.6		
43	047058	DRILL AND PRESSURE GROUT	LF	150		
44	511106	DRILL AND BOND DOWEL	LF	170		
45 (S)	515063	CORE CONCRETE (4")	LF	6		
46 (S)	515065	CORE CONCRETE (6")	LF	48		
47 (S)	515067	CORE CONCRETE (8")	LF	4		
48 (S)	515068	CORE CONCRETE (9")	LF	14		
49 (S)	012179	CORE CONCRETE (20")	LF	2		
50	519080	JOINT SEAL	LF	76		
51 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	102,500		
52 (S)	590135	SPOT BLAST CLEAN AND PAINT UNDERCOAT	SQFT	25		
53 (S)	590301	WORK AREA MONITORING	LS	LUMP SUM	LUMP SUM	
54	012560	18" REINFORCED CONCRETE PIPE (HAZARDOUS MATERIAL)	LF	210		
55	012561	6" CORRUGATED STEEL PIPE (.079" THICK) (HAZARDOUS MATERIAL)	LF	12		
56	012562	18" CORRUGATED STEEL PIPE (.109" THICK) (HAZARDOUS MATERIAL)	LF	150		
57	012180	6" STEEL PIPE DOWNDRAIN	LF	24		
58	012563	36" CORRUGATED STEEL PIPE INLET (.138" THICK) (HAZARDOUS MATERIAL)	LF	16		
59	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	12		
60 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	LB	6,550		

REVISED PER ADDENDUM NO. 1 DATED APRIL 16, 1998

ENGINEER'S ESTIMATE**04-043474**

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (S-F)	750498	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	LB	1,440		
62 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	47,500		
63	012564	6" CAST IRON PIPE (HAZARDOUS MATERIAL)	LF	4		
64 (S)	800360	CHAIN LINK FENCE (TYPE CL-6)	LF	650		
65 (S)	802520	6' CHAIN LINK GATE (TYPE CL-6)	EA	2		
66 (S)	012182	CRASH CUSHION (HI-DRO SANDWICH SYSTEM)	EA	1		
67	012183	CONCRETE BARRIER (TYPE 60C MODIFIED)	LF	250		
68	012184	CONCRETE BARRIER (TYPE 60D MODIFIED)	LF	180		
69 (S)	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	4,080		
70 (S)	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	9,580		
71 (S)	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	1,550		
72 (S)	850102	PAVEMENT MARKER (REFLECTIVE)	EA	530		
73 (S)	912185	SEISMIC RETROFIT (ELECTRICAL FACILITIES)	LS	LUMP SUM	LUMP SUM	
74	192023	STRUCTURE EXCAVATION (TYPE H)	CY	370		
75	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

TOTAL BID: _____

REVISED PER ADDENDUM NO. 1 DATED APRIL 16, 1998

IMPORTANT SPECIAL NOTICES

- Attention is directed to Section 2, Section 3, Sections entitled "DVBE Records," "Performance of DVBE Subcontractors and Suppliers," and "DVBE Goal for this Project," of the Special Provisions. Attention is also directed to the Caltrans Bidder - DVBE - Information form and Good Faith Efforts forms in the Proposal and Contract book for this project.
- The bidder's attention is directed to the following special requirements for this project concerning submission of DVBE information, award and execution of contract, and beginning of work:

First-tier subcontractors that will be used for meeting DVBE goals must be listed in the "List of Subcontractors" form regardless of dollar amount of work to be performed. Second- and lower-tier subcontractors need not be listed on the "List of Subcontractors" form. Other, non-DVBE subcontractors are to be listed on the "List of Subcontractors" form in accordance with the requirements in Section 2-1.054 of the Standard Specifications and the Special Provisions.

Identify second- and lower-tier DVBE subcontractors on the "Caltrans Bidder DVBE Information" form.

DVBE information shall be submitted **with the bid proposal**. (See **Section 2-1.04** of the special provisions.) The evaluation of the effort to meet the DVBE goal will be based on the information provided with the bid proposal. If the goal was not met, Caltrans' determination of good faith effort will be based on the information provided with the bid, and the decision will be final. Bidders and all subcontractors listed in the DVBE Information shall be available, by phone, on the day following the bid opening.

The DVBE information shall include all DVBE partners.

It is anticipated that this contract will be awarded within **10 days after bid opening**.

If the Bidder submits cash or a cashier's check or a certified check as the form of bidder's security (see Section 2-1.07 of the Standard Specifications), the Bidder shall also include with the bid submittal a signed and notarized affidavit from an admitted surety insurer that contract bonds, as required by Section 3-1.02, "Contract Bonds," of the Standard Specifications, will be provided within the specified time for executing and returning the contract for approval.

If the bidder claims a mistake was made in his bid, the bidder shall give the Department written notice within 48-hours, not including Saturdays, Sundays and legal holidays, after the opening of bids of the alleged mistake in lieu of the 5 days specified in Section 2-1.095, "Relief of Bidders," in the Standard Specifications. (See Section 2-1.01 of the special provisions.) Caltrans' FAX number for submitting this information is (916)227-6282. Such information shall be submitted "Attention Office Engineer."

The contract shall be signed by the successful bidder and shall be received with contract bonds by the Office of Office Engineer within **4 days**, including Saturdays, Sundays and legal holidays, after the bidder has received notice that the contract has been awarded. (See Section 3 of the special provisions.)

If properly executed by the bidder, it is anticipated the contract will be approved within 24 hours of when the executed contract and contract bonds are received by the Department.

The Contractor shall begin work within 5 calendar days after receiving notice that the contract has been approved. The contract work shall be completed before the expiration of **220 WORKING DAYS** beginning at **12:01 a.m. on the FIRST WORKING DAY AFTER CONTRACT AWARD**. (See Section 4 of the special provisions.)

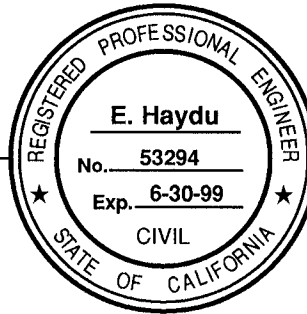
The following forms have been included at the end of the Proposal and Contract book to assist the successful bidder in early execution of the contract documents: Payment Bond, Performance Bond, Insurance, Vendor Data Record.

CONTRACT NO. 04 -043474

The special provisions contained herein have been prepared by or under the direction of the following Registered Persons.

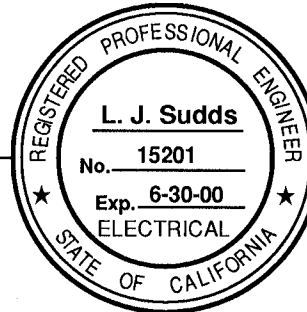
HIGHWAY


REGISTERED CIVIL ENGINEER



ELECTRICAL


REGISTERED ELECTRICAL ENGINEER



ENVIRONMENTAL


REGISTERED CIVIL ENGINEER



CONTRACT NO. 04 -043474

The special provisions contained herein have been prepared by or under the direction of the following Registered Person.

MECHANICAL



REGISTERED MECHANICAL ENGINEER



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DEPARTMENT OF TRANSPORTATION

NOTICE TO CONTRACTORS

THIS IS AN INFORMAL BIDS CONTRACT

CONTRACT NO. 04-043474

04-SF-80-7.5/7.7

Sealed proposals for the work shown on the plans entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROJECT
PLANS FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY AND
COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND TUNNEL
APPROACH (WEST VIADUCT)**

will be received at the Department of Transportation, 1120 N Street, Room 0200, MS #26, Sacramento, California 95814, until 2 o'clock p.m. on May 5, 1998, at which time they will be publicly opened and read in Room 0100 at the same address.

Proposal forms for this work are included in a separate book entitled:

**STATE OF CALIFORNIA; DEPARTMENT OF TRANSPORTATION; PROPOSAL
AND CONTRACT FOR CONSTRUCTION ON STATE HIGHWAY IN THE CITY
AND COUNTY OF SAN FRANCISCO AT YERBA BUENA ISLAND TUNNEL
APPROACH (WEST VIADUCT)**

General work description: TOLL BRIDGE Seismic Retrofit of San Francisco - Oakland Bay Bridge (YERBA BUENA ISLAND TUNNEL APPROACH)

This project has a goal of 3 percent disabled veteran business enterprise (DVBE) participation.
No pre-bid meeting is scheduled for this project.

Bids are required for the entire work described herein.

At the time this contract is awarded, the Contractor shall possess either a Class A license or a combination of Class C licenses which constitutes a majority of the work.

The Contractor must also be properly licensed at the time the bid is submitted, except that on a joint venture bid a joint venture license may be obtained by a combination of licenses after bid opening but before award in accordance with Business and Professions Code, Section 7029.1.

This contract is subject to state contract nondiscrimination and compliance requirements pursuant to Government Code, Section 12990.

Preference will be granted to bidders properly certified as a "Small Business" as determined by the Department of General Services, Office of Small and Minority Business at the time of bid opening in accordance with the provisions in Section 2-1.04, "Small Business Preference," of the special provisions, and Section 1896 et seq, Title 2, California Code of Regulations. A form for requesting a "Small Business" preference is included with the bid documents. Applications for status as a "Small Business" must be submitted to the Department of General Services, Office of Small and Minority Business, 1531 "I" Street, Second Floor, Sacramento, CA 95814, Telephone No. (916) 322-5060.

Contract No. 04-043474

A reciprocal preference will be granted to "California company" bidders in accordance with Section 6107 of the Public Contract Code. (See Sections 2 and 3 of the special provisions.) A form for indicating whether bidders are or are not a "California company" is included in the bid documents and is to be filled in and signed by all bidders.

Project plans, special provisions, and proposal forms for bidding this project can only be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, MS #26, Sacramento, California 95814, FAX No. (916) 654-7028, Telephone No. (916) 654-4490. Use FAX orders to expedite orders for project plans, special provisions and proposal forms. FAX orders must include credit card charge number, card expiration date and authorizing signature. Project plans, special provisions, and proposal forms may be seen at the above Department of Transportation office and at the offices of the District Directors of Transportation at Santa Ana, Oakland, and the district in which the work is situated. Standard Specifications and Standard Plans are available through the State of California, Department of Transportation, Publications Unit, 1900 Royal Oaks Drive, Sacramento, CA 95815, Telephone No. (916) 445-3520.

Cross sections for this project are not available.

The successful bidder shall furnish a payment bond and a performance bond.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated, and available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>. Future effective general prevailing wage rates which have been predetermined and are on file with the Department of Industrial Relations are referenced but not printed in the general prevailing wage rates.

DEPARTMENT OF TRANSPORTATION

Deputy Director Transportation Engineering

Dated March 23, 1998

RRF/DB

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
1	010187	REMOVE STANDARD HI-DRO CRASH CUSHION	EA	1		
2	012172	ELECTRONIC MOBILE DAILY DIARY COMPUTER SYSTEM	LS	LUMP SUM	LUMP SUM	
3	012173	ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY	LS	LUMP SUM	LUMP SUM	
4	011835	TIME RELATED OVERHEAD	WDAY	220		
5	070010	PROGRESS SCHEDULE (CRITICAL PATH)	LS	LUMP SUM	LUMP SUM	
6	012174	ESCROW OF BID DOCUMENTATION	LS	LUMP SUM	LUMP SUM	
7	072006	TEMPORARY SUPPORT	LS	LUMP SUM	LUMP SUM	
8	047057	TEMPORARY DECK BRIDGING	LS	LUMP SUM	LUMP SUM	
9	074019	PREPARE STORM WATER POLLUTION PREVENTION PLAN	LS	LUMP SUM	LUMP SUM	
10	074020	WATER POLLUTION CONTROL	LS	LUMP SUM	LUMP SUM	
11 (S)	120090	CONSTRUCTION AREA SIGNS	LS	LUMP SUM	LUMP SUM	
12 (S)	120100	TRAFFIC CONTROL SYSTEM	LS	LUMP SUM	LUMP SUM	
13	120165	CHANNELIZER (SURFACE MOUNTED)	EA	26		
14	129000	TEMPORARY RAILING (TYPE K)	LF	680		
15	129100	TEMPORARY CRASH CUSHION MODULE	EA	8		
16	150206	ABANDON CULVERT	EA	6		
17	012176	ABANDON VAULT	EA	1		
18	150227	ABANDON PIPELINE	LF	300		
19	150711	REMOVE PAINTED TRAFFIC STRIPE	LF	4,460		
20	150714	REMOVE THERMOPLASTIC TRAFFIC STRIPE	LF	1,530		

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)

04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
21	150722	REMOVE PAVEMENT MARKER	EA	2,070		
22	150806	REMOVE PIPE	LF	4		
23	150820	REMOVE INLET	EA	3		
24	150846	REMOVE CONCRETE PAVEMENT	CY	24		
25	152320	RESET ROADSIDE SIGN	EA	1		
26	012177	MODIFY WATER AND AIR LINES (BRIDGE)	LS	LUMP SUM	LUMP SUM	
27	153210	REMOVE CONCRETE	CY	38		
28	153221	REMOVE CONCRETE BARRIER	LF	250		
29	012178	REMOVE CRASH CUSHION PANELS AND CELLS	LF	180		
30	157560	BRIDGE REMOVAL (PORTION)	LS	LUMP SUM	LUMP SUM	
31	160101	CLEARING AND GRUBBING	LS	LUMP SUM	LUMP SUM	
32 (F)	192003	STRUCTURE EXCAVATION (BRIDGE)	CY	515		
33 (F)	193003	STRUCTURE BACKFILL (BRIDGE)	CY	380		
34	390101	ASPHALT CONCRETE	TON	46		
35	401000	CONCRETE PAVEMENT	CY	24		
36 (S)	500060	TIEDOWN ANCHOR	EA	40		
37 (F)	510051	STRUCTURAL CONCRETE, BRIDGE FOOTING	CY	202		
38 (F)	510053	STRUCTURAL CONCRETE, BRIDGE	CY	232		
39 (F)	510502	MINOR CONCRETE (MINOR STRUCTURE)	CY	3.3		
40 (F)	012559	MINOR CONCRETE (MINOR STRUCTURE) (HAZARDOUS MATERIAL)	CY	11		

COPY OF ENGINEER'S ESTIMATE
(NOT TO BE USED FOR BIDDING PURPOSES)
04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
41	510522	MINOR CONCRETE (PIPE COVER)	CY	13		
42	510526	MINOR CONCRETE (BACKFILL)	CY	4.6		
43	047058	DRILL AND PRESSURE GROUT	LF	150		
44	511106	DRILL AND BOND DOWEL	LF	170		
45 (S)	515063	CORE CONCRETE (4")	LF	6		
46 (S)	515065	CORE CONCRETE (6")	LF	48		
47 (S)	515067	CORE CONCRETE (8")	LF	4		
48 (S)	515068	CORE CONCRETE (9")	LF	14		
49 (S)	012179	CORE CONCRETE (20")	LF	2		
50	519080	JOINT SEAL	LF	76		
51 (S-F)	520102	BAR REINFORCING STEEL (BRIDGE)	LB	102,500		
52 (S)	590135	SPOT BLAST CLEAN AND PAINT UNDERCOAT	SQFT	25		
53 (S)	590301	WORK AREA MONITORING	LS	LUMP SUM	LUMP SUM	
54	012560	18" REINFORCED CONCRETE PIPE (HAZARDOUS MATERIAL)	LF	210		
55	012561	6" CORRUGATED STEEL PIPE (.079" THICK) (HAZARDOUS MATERIAL)	LF	12		
56	012562	18" CORRUGATED STEEL PIPE (.109" THICK) (HAZARDOUS MATERIAL)	LF	150		
57	012180	6" STEEL PIPE DOWNDRAIN	LF	24		
58	012563	36" CORRUGATED STEEL PIPE INLET (.138" THICK) (HAZARDOUS MATERIAL)	LF	16		
59	731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)	CY	12		
60 (S-F)	750001	MISCELLANEOUS IRON AND STEEL	LB	1,940		

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04-043474

Item	Item Code	Item	Unit of Measure	Estimated Quantity	Unit Price	Item Total
61 (S-F)	750498	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	LB	1,440		
62 (S-F)	750501	MISCELLANEOUS METAL (BRIDGE)	LB	47,500		
63	012564	6" CAST IRON PIPE (HAZARDOUS MATERIAL)	LF	4		
64 (S)	800360	CHAIN LINK FENCE (TYPE CL-6)	LF	650		
65 (S)	802520	6' CHAIN LINK GATE (TYPE CL-6)	EA	2		
66 (S)	012182	CRASH CUSHION (HI-DRO SANDWICH SYSTEM)	EA	1		
67	012183	CONCRETE BARRIER (TYPE 60C MODIFIED)	LF	250		
68	012184	CONCRETE BARRIER (TYPE 60D MODIFIED)	LF	180		
69 (S)	840504	4" THERMOPLASTIC TRAFFIC STRIPE	LF	4,080		
70 (S)	840656	PAINT TRAFFIC STRIPE (2-COAT)	LF	9,580		
71 (S)	850101	PAVEMENT MARKER (NON-REFLECTIVE)	EA	1,550		
72 (S)	850102	PAVEMENT MARKER (REFLECTIVE)	EA	530		
73 (S)	912185	SEISMIC RETROFIT (ELECTRICAL FACILITIES)	LS	LUMP SUM	LUMP SUM	
74	999990	MOBILIZATION	LS	LUMP SUM	LUMP SUM	

**STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION**

SPECIAL PROVISIONS

Annexed to Contract No. 04-043474

SECTION 1. SPECIFICATIONS AND PLANS

The work embraced herein shall be done in accordance with the Standard Specifications dated July, 1992, and the Standard Plans dated July, 1992, of the Department of Transportation insofar as the same may apply and in accordance with the following special provisions.

In case of conflict between the Standard Specifications and these special provisions, the special provisions shall take precedence over and be used in lieu of the conflicting portions.

SECTION 2. PROPOSAL REQUIREMENTS AND CONDITIONS

2-1.01 GENERAL

The bidder's attention is directed to the provisions in Section 2, "Proposal Requirements and Conditions," of the Standard Specifications and these special provisions for the requirements and conditions which the bidder must observe in the preparation of the proposal form and the submission of the bid.

In addition to the subcontractors required to be listed in accordance with Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications, each proposal shall have listed therein the name and address of each DVBE subcontractor to be used for credit in meeting the goal, and to whom the bidder proposes to directly subcontract portions of the work. The list of subcontractors shall also set forth the portion of work that will be done by each subcontractor listed. A sheet for listing the subcontractors is included in the Proposal.

If the Bidder submits cash or a cashier's check or a certified check as the form of bidder's security (See said Section 2-1.07 of the Standard Specifications), the Bidder shall also include with the bid submittal a signed and notarized affidavit from an admitted surety insurer that contract bonds, as required by Section 3-1.02, "Contract Bonds," of the Standard Specifications, will be provided within the time specified elsewhere in these special provisions for executing and returning the contract for approval.

The form of Bidder's Bond mentioned in the last paragraph in Section 2-1.07, "Proposal Guaranty," of the Standard Specifications will be found following the signature page of the Proposal.

In accordance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Proposal. Signing the Proposal shall also constitute signature of the Noncollusion Affidavit.

If the bidder claims a mistake was made in his bid, the bidder shall give the Department written notice within 48 hours, not including Saturdays, Sundays and legal holidays, after the opening of bids of the alleged mistake, in lieu of the 5 days specified in Section 2-1.095, "Relief of Bidders," in the Standard Specifications. The notice of alleged mistake shall specify in detail how the mistake occurred.

2-1.02 DISABLED VETERAN BUSINESS ENTERPRISE (DVBE)

Section 10115 of the Public Contract Code requires the Department to implement provisions to establish a goal for Disabled Veterans Business Enterprise (DVBE) in contracts.

It is the policy of the Department that Disabled Veteran Business Enterprise (DVBE) shall have the maximum opportunity to participate in the performance of contracts financed solely with state funds. The Contractor shall ensure that DVBEs have the maximum opportunity to participate in the performance of this contract and shall take all necessary and reasonable steps for this assurance. The Contractor shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of subcontracts. Failure to carry out the requirements of this paragraph shall constitute a breach of contract and may result in termination of this contract or other remedy the Department may deem appropriate.

Bidder's attention is directed to the following:

(a) "Disabled Veteran Business Enterprise" (DVBE) means a business concern certified as a DVBE by the Office of Small and Minority Business, Department of General Services.

(b) A DVBE may participate as a prime contractor, subcontractor, joint venture partner with a prime or subcontractor, or vendor of material or supplies;

(c) Credit for DVBE prime contractors will be 100 percent.

(d) A DVBE joint venture partner must be responsible for specific contract items of work, or portions thereof. Responsibility means actually performing, managing and supervising the work with its own forces. The DVBE joint venture partner must share in the ownership, control, management responsibilities, risks and profits of the joint venture. The DVBE joint venturer must submit the joint venture agreement with the Caltrans Bidder DVBE Information form required in Section 2-1.04, "Submission of DVBE Information," elsewhere in these special provisions;

(e) A DVBE must perform a commercially useful function, i.e., must be responsible for the execution of a distinct element of the work and must carry out its responsibility by actually performing, managing and supervising the work;

(f) Credit for DVBE vendors of materials or supplies is limited to 60 percent of the amount to be paid to the vendor for the material unless the vendor manufactures or substantially alters the goods;

(g) Credit for trucking by DVBEs will be as follows:

(1) One hundred percent of the amount to be paid when a DVBE trucker will perform the trucking with his/her own trucks, tractors and employees;

(2) Twenty percent of the amount to be paid to DVBE trucking brokers who do not have a "certified roster";

(3) One hundred percent of the amount to be paid to DVBE trucking brokers who have:

a. signed agreements that all trucking will be performed by DVBE truckers if credit is toward the DVBE goal;

b. a "certified roster" showing that all trucks are owned by DVBEs; and

c. a signed statement on the "certified roster" that indicates that 100 percent of revenue paid by the broker will be paid to the DVBEs listed on the "certified roster".

(4) Twenty percent of the amount to be paid to trucking brokers who are not a DVBE but who have:

a. signed agreements with DVBE truckers assuring that at least 20 percent of the trucking will be performed by DVBE truckers if credit is toward the DVBE goal;

b. a "certified roster" showing that at least 20 percent of the number of trucks are owned by DVBE truckers; and

c. a signed statement on the "certified roster" that indicates that at least 20 percent of the revenue paid by the broker will be paid to the DVBEs listed on the "certified roster".

The "certified roster" referred to herein shall conform to the requirements in Section 3-1.01A, "DVBE Information," elsewhere in these special provisions;

(h) DVBEs and DVBE joint venture partners must be certified DVBEs as determined by the Department of General Services, Office of Small and Minority Business, 1531 "I" Street, Second Floor, Sacramento, CA 95814, on the date bids for the project are opened before credit may be allowed toward the DVBE goal.

It is the Contractor's responsibility to verify that DVBEs are certified;

(i) Noncompliance by the Contractor with these requirements constitutes a breach of this contract and may result in termination of the contract or other appropriate remedy for a breach of this contract.

2-1.03 DVBE GOAL FOR THIS PROJECT

The Department has established the following goal for Disabled Veteran Business Enterprise (DVBE) participation for this project:

Disabled Veteran Business Enterprise (DVBE), 3 percent.

It is the bidder's responsibility to make a sufficient portion of the work available to subcontractors and suppliers and to select those portions of the work or material needs consistent with the available DVBE subcontractors and suppliers, so as to assure meeting the goal for DVBE participation.

The Office of Small and Minority Business, Department of General Services, may be contacted at (916) 322-5060 or visit their internet web site at www.dgs.ca.gov/osmb for program information and certification status. The Department's Business Enterprise Program may also be contacted at (916) 227-9599 or the internet web site at <http://www.dot.ca.gov/hq/bep/>.

2-1.04 SUBMISSION OF DVBE INFORMATION

The required DVBE information shall be submitted **WITH THE BID** on the following "CALTRANS BIDDER - DVBE - INFORMATION" and "TELEPHONE LOG AND LIST OF REJECTED DVBEs."

It is the bidder's responsibility to meet the goal for DVBE participation or to establish that, prior to bidding, the bidder made good faith efforts to do so based on the information in the "CALTRANS BIDDER - DVBE - INFORMATION" and "TELEPHONE LOG AND LIST OF REJECTED DVBEs."

The information to show that the DVBE goal will be met on the "CALTRANS BIDDER - DVBE - INFORMATION" form shall include the names of DVBEs and DVBE joint venture partners to be used, with a complete description of work or supplies to be provided by each and the dollar value of each such DVBE transaction. When 100 percent of a contract item of work is not to be performed or furnished by a DVBE, a description of the exact portion of said work to be performed or furnished by that DVBE shall be included in the DVBE information, including the planned location of said work. DVBE prime contractors shall enter their Office of Small and Minority Business (OSMB) - DVBE reference number and/or DBA name, as listed with OSMB, on the line provided. (Note: DVBE subcontractors to whom the bidder proposes to directly subcontract portions of the work are to be named in the bid. - See Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications and Section 2-1.01, "General," of these special provisions, regarding listing of proposed subcontractors).

If credit for trucking by a DVBE trucking broker is shown on the bidder's information as 100 percent of the revenue to be paid by the broker is to be paid to DVBE truckers, a "certified roster" of the broker's trucks to be used must be included with the bid. The "certified roster" must indicate that all the trucks are owned by certified DVBEs and must show the DVBE truck numbers, owner's name, Public Utilities Commission Cal-T numbers, and the DVBE certification numbers. The roster must indicate that all revenue paid by the broker will be paid to DVBEs listed on the "certified roster".

If credit for trucking by a trucking broker who is not a DVBE is shown in the bidder's information, a "certified roster" of the broker's trucks to be used must be included with the bid. The "certified roster" must indicate that at least 20 percent of the broker's trucks are owned by DVBEs and must show the DVBE truck numbers, owner's name, Public Utilities Commission Cal-T numbers, and the DVBE certification numbers. The roster must indicate that at least 20 percent of the revenue paid by the broker will be paid to DVBEs listed on the "certified roster".

Information necessary to establish the bidder's good faith efforts to meet the DVBE goals shall be included in the "TELEPHONE LOG AND LIST OF REJECTED DVBEs" form located in the Proposal and shall include:

1. The names, dates and times of notices of all certified DVBEs solicited by telephone for this project and the dates, times and methods used for following up initial solicitations to determine with certainty whether the DVBEs were interested.
2. The names of DVBEs who submitted bids which were not accepted and the reason for rejection of the DVBEs bid.

Bidders are cautioned that even though their submittal indicates they will meet the stated DVBE goal, their submittal should also include the telephone log and rejected DVBE information to protect their eligibility for award of the contract in the event the Department, in its review, finds that the goal has not been met.

It is the bidders responsibility to be available, by phone, both the day of and the day after the bid opening to answer questions and provide good faith effort clarification. The bidder shall also assure that listed DVBEs are available, by phone, on both days.

If it is found that the goal has not been met, the Department will review the information submitted with the bid to determine the bidder's good faith effort. In the event that the Department determines that a bidder has not made a good faith effort based on the information submitted with the bid and its independent investigation, the Department's decision will be final.

2-1.05 SMALL BUSINESS PREFERENCE

Attention is directed to "Award and Execution of Contract" elsewhere in these special provisions.

Attention is also directed to the Small Business Procurement and Contract Act, Government Code Section 14835, et seq and Title 2, California Code of Regulations, Section 1896, et seq.

Bidders who wish to be classified as a Small Business under the provisions of those laws and regulations, shall be certified as Small Business by the Department of General Services, Office of Small and Minority Business, 1531 "I" Street, Second Floor, Sacramento, CA 95814.

To request Small Business Preference, bidders shall fill out and sign the Request for Small Business Preference form in the Proposal and shall attach a copy of their Office of Small and Minority Business (OSMB) small business certification letter to the form. The bidder's signature on the Request for Small Business Preference certifies, under

penalty of perjury, that the bidder is certified as Small Business at the time of bid opening and further certifies, under penalty of perjury, that under the following conditions, at least 50 percent of the subcontractors to be utilized on the project are either certified Small Business or have applied for Small Business certification by bid opening date and are subsequently granted Small Business certification.

The conditions requiring the aforementioned 50 percent level of subcontracting by Small Business subcontractors apply if:

1. The lowest responsible bid for the project exceeds \$100 000; and
2. The project work to be performed requires a Class A or a Class B contractor's license; and
3. Two or more subcontractors will be used.

If the above conditions apply and Small Business Preference is granted in the award of the contract, the 50 percent Small Business subcontractor utilization level shall be maintained throughout the life of the contract.

2-1.06 CALIFORNIA COMPANY PREFERENCE

Attention is directed to "Award and Execution of Contract" of these special provisions.

In accordance with the requirements of Section 6107 of the Public Contract Code, a "California company" will be granted a reciprocal preference for bid comparison purposes as against a nonresident contractor from any state that gives or requires a preference to be given contractors from that state on its public entity construction contracts.

A "California company" means a sole proprietorship, partnership, joint venture, corporation, or other business entity that was a licensed California contractor on the date when bids for the public contract were opened and meets one of the following:

- (1) Has its principal place of business in California.
- (2) Has its principal place of business in a state in which there is no local contractor preference on construction contracts.
- (3) Has its principal place of business in a state in which there is a local contractor construction preference and the contractor has paid not less than \$5000 in sales or use taxes to California for construction related activity for each of the five years immediately preceding the submission of the bid.

To carry out the "California company" reciprocal preference requirements of Section 6107 of the Public Contract Code, all bidders shall fill out and sign the California Company Preference form in the Proposal. The bidder's signature on the California Company Preference form certifies, under penalty of perjury, that the bidder is or is not a "California company" and if not, the amount of the preference applied by the state of the nonresident Contractor.

A nonresident Contractor shall disclose any and all bid preferences provided to the nonresident Contractor by the state or country in which the nonresident Contractor has its principal place of business.

Proposals without the California Company Preference form filled out and signed may be rejected.

SECTION 3. AWARD AND EXECUTION OF CONTRACT

The bidder's attention is directed to the provisions in Section 3, "Award and Execution of Contract," of the Standard Specifications and these special provisions for the requirements and conditions concerning award and execution of contract.

The award of contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed and who has met the goals for DVBE participation or has demonstrated, to the satisfaction of the Department, good faith effort to do so. Meeting the goals for DVBE participation or demonstrating, to the satisfaction of the Department, good faith efforts to do so is a condition for being eligible for award of contract.

It is anticipated that this contract will be awarded within 10 days after the bid opening.

Each of the two bonds required in Section 3-1.02, "Contract Bonds," of the Standard Specifications shall be in a sum equal to 100 percent of the contract price.

The contract shall be signed by the successful bidder and shall be received with contract bonds by the Department within **4 days**, including Saturdays, Sundays and legal holidays, after the bidder has received notice that the contract has been awarded. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address: Department of Transportation, P.O. Box 942874, Sacramento, CA 94274-0001, Attn: Office Engineer (MS 43)- Contracts.

Within 2 days, not including Saturdays, Sundays and legal holidays, of return of the executed contract and bonds, the Department will notify the successful bidder of either approval of the contract by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation, or disapproval of the submittal. Should the

Department fail to provide notification within said 2 days, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

A "Vendor Data Record" form will be included in the contract documents to be executed by the successful bidder. The purpose of the form is to facilitate the collection of taxpayer identification data. The form shall be completed and returned to the Department by the successful bidder with the executed contract and contract bonds. For the purposes of the form, vendor shall be deemed to mean the successful bidder. The form is not to be completed for subcontractors or suppliers. Failure to complete and return the "Vendor Data Record" form to the Department as provided herein will result in the retention of 20 percent of payments due the contractor and penalties of up to \$20 000. This retention of payments for failure to complete the "Vendor Data Record" form is in addition to any other retention of payments due the Contractor.

Attention is also directed to "Small Business Preference" of these special provisions. Any bidder who is certified as a Small Business by the Department of General Services, Office of Small and Minority Business will be allowed a preference in the award of this contract, if it be awarded, under the following conditions:

- (1) The apparent low bidder is not certified as a Small Business, or has not filled out and signed the Request for Small Business Preference included with the bid documents and attached a copy of their Office of Small and Minority Business (OSMB) small business certification letter to the form; and
- (2) The bidder filled out and signed the Request for Small Business Preference form included with the bid documents and attached a copy of their Office of Small and Minority Business (OSMB) small business certification letter to the form.

The small business preference will be a reduction in the bid submitted by the small business contractor, for bid comparison purposes, by an amount equal to 5 percent of the amount bid by the apparent low bidder, the amount not to exceed \$50 000. If this reduction results in the small business contractor becoming the low bidder, then the contract will be awarded to the small business contractor on the basis of the actual bid of the small business contractor notwithstanding the reduced bid price used for bid comparison purposes.

Attention is also directed to "California Company Preference" of these special provisions.

The amount of the California company reciprocal preference shall be equal to the amount of the preference applied by the state of the nonresident contractor with the lowest responsive bid, except where the "California company" is eligible for a California Small Business Preference, in which case the preference applied shall be the greater of the two, but not both.

If the bidder submitting the lowest responsive bid is not a "California company" and with the benefit of the reciprocal preference, a "California company's" responsive bid is equal to or less than the original lowest responsive bid, the "California company" will be awarded the contract at its submitted bid price except as provided below.

Small business bidders shall have precedence over nonsmall business bidders in that the application of the "California company" preference for which nonsmall business bidders may be eligible shall not result in the denial of the award to a small business bidder.

SECTION 4. BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to the provisions in Section 8-1.03, "Beginning of Work," in Section 8-1.06, "Time of Completion," and in Section 8-1.07, "Liquidated Damages," of the Standard Specifications and these special provisions.

The Contractor shall begin work within 5 calendar days after the contract has been approved by the Attorney General or the attorney appointed and authorized to represent the Department of Transportation.

This work shall be diligently prosecuted to completion before the expiration of

220 WORKING DAYS

beginning at 12:01 a.m. on the **FIRST WORKING DAY AFTER CONTRACT AWARD.**

The Contractor shall pay to the State of California the sum of \$650 per day, for each and every calendar day's delay in finishing the work in excess of the number of working days prescribed above. The 72 hours advance notice before beginning work as referred to in said Section 8-1.03 is changed to 24 hours advance notice for this project.

SECTION 5. GENERAL

SECTION 5-1. MISCELLANEOUS

5-1.01 LABOR NONDISCRIMINATION

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM (GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7-1.01A(4), "Labor Nondiscrimination," of the Standard Specifications, which is applicable to all nonexempt state contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The Specifications are applicable to all nonexempt state construction contracts and subcontracts of \$5,000 or more.

5-1.02 LABOR CODE REQUIREMENTS

Section 7-1.01A(1), "Hours of Labor," of the Standard Specifications is amended to read:

7-1.01A(1) Hours of Labor.— Eight hours labor constitutes a legal day's work. The Contractor or any subcontractor under the Contractor shall forfeit, as a penalty to the State of California, \$25 for each worker employed in the execution of the contract by the respective Contractor or subcontractor for each calendar day during which that worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of the Labor Code, and in particular, Section 1810 to Section 1815, thereof, inclusive, except that work performed by employees of Contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon compensation for all hours worked in excess of 8 hours per day at not less than one and one-half times the basic rate of pay, as provided in Section 1815 thereof.

Section 7-1.01A(2), "Prevailing Wage," of the Standard Specifications is amended to read:

7-1.01A(2) Prevailing Wage.— The Contractor and any subcontractor under the Contractor shall comply with Labor Code Sections 1774 and 1775. Pursuant to Section 1775, the Contractor and any subcontractor under the Contractor shall forfeit to the State or political subdivision on whose behalf the contract is made or awarded a penalty of not more than fifty dollars (\$50) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the Director of Industrial Relations for the work or craft in which the worker is employed for any public work done under the contract by the Contractor or by any subcontractor under the Contractor in violation of the provisions of the Labor Code and in particular, Labor Code Sections 1770 to 1780, inclusive. The amount of this forfeiture shall be determined by the Labor Commissioner and shall be based on consideration of the mistake, inadvertence, or neglect of the Contractor or subcontractor in failing to pay the correct rate of prevailing wages, or the previous record of the Contractor or subcontractor in meeting their respective prevailing wage obligations, or the willful failure by the Contractor or subcontractor to pay the correct rates of prevailing wages. A mistake, inadvertence, or neglect in failing to pay the correct rate of prevailing wages is not excusable if the Contractor or subcontractor had knowledge of the obligations under the Labor Code. In addition to the penalty and pursuant to Labor Code Section 1775, the difference between the prevailing wage rates and the amount paid to each worker for each calendar day or portion thereof for which each worker was paid less than the prevailing wage rate shall be paid to each worker by the Contractor or subcontractor. If a worker employed by a subcontractor on a public works project is not paid the general prevailing per diem wages by the subcontractor, the prime contractor of the project is not liable for the penalties described above unless the prime contractor had knowledge of that failure of the subcontractor to pay the specified prevailing rate of wages to those workers or unless the prime contractor fails to comply with all of the following requirements:

1. The contract executed between the contractor and the subcontractor for the performance of work on the public works project shall include a copy of the provisions of Sections 1771, 1775, 1776, 1777.5, 1813, and 1815 of the Labor Code.
2. The contractor shall monitor the payment of the specified general prevailing rate of per diem wages by the subcontractor to the employees, by periodic review of the certified payroll records of the subcontractor.
3. Upon becoming aware of the subcontractor's failure to pay the specified prevailing rate of wages to the subcontractor's workers, the contractor shall diligently take corrective action to halt or rectify the failure, including, but not limited to, retaining sufficient funds due the subcontractor for work performed on the public works project.
4. Prior to making final payment to the subcontractor for work performed on the public works project, the contractor shall obtain an affidavit signed under penalty of perjury from the subcontractor that the

subcontractor has paid the specified general prevailing rate of per diem wages to the subcontractor's employees on the public works project and any amounts due pursuant to Section 1813 of the Labor Code.

Pursuant to Section 1775 of the Labor Code, the Division of Labor Standards Enforcement shall notify the Contractor on a public works project within 15 days of the receipt by the Division of Labor Standards Enforcement of a complaint of the failure of a subcontractor on that public works project to pay workers the general prevailing rate of per diem wages. If the Division of Labor Standards Enforcement determines that employees of a subcontractor were not paid the general prevailing rate of per diem wages and if the Department did not retain sufficient money under the contract to pay those employees the balance of wages owed under the general prevailing rate of per diem wages, the contractor shall withhold an amount of moneys due the subcontractor sufficient to pay those employees the general prevailing rate of per diem wages if requested by the Division of Labor Standards Enforcement. The Contractor shall pay any money retained from and owed to a subcontractor upon receipt of notification by the Division of Labor Standards Enforcement that the wage complaint has been resolved. If notice of the resolution of the wage complaint has not been received by the Contractor within 180 days of the filing of a valid notice of completion or acceptance of the public works project, whichever occurs later, the Contractor shall pay all moneys retained from the subcontractor to the Department. These moneys shall be retained by the Department pending the final decision of an enforcement action.

Pursuant to the provisions of Section 1773 of the Labor Code, the Department has obtained the general prevailing rate of wages (which rate includes employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Section 1773.8 of the Labor Code, apprenticeship or other training programs authorized by Section 3093 of the Labor Code, and similar purposes) applicable to the work to be done, for straight time, overtime, Saturday, Sunday and holiday work. The holiday wage rate listed shall be applicable to all holidays recognized in the collective bargaining agreement of the particular craft, classification or type of workmen concerned. The general prevailing wage rates and any applicable changes to these wage rates are available at the Labor Compliance Office at the offices of the District Director of Transportation for the district in which the work is situated. For work situated in District 9, the wage rates are available at the Labor Compliance Office at the offices of the District Director of Transportation for District 6, located at Fresno. General prevailing wage rates are also available from the California Department of Industrial Relations' Internet Web Site at: <http://www.dir.ca.gov>.

The wage rates determined by the Director of Industrial Relations for the project refer to expiration dates. Prevailing wage determinations with a single asterisk after the expiration date are in effect on the date of advertisement for bids and are good for the life of the contract. Prevailing wage determinations with double asterisks after the expiration date indicate that the wage rate to be paid for work performed after this date has been determined. If work is to extend past this date, the new rate shall be paid and incorporated in the contract. The Contractor shall contact the Department of Industrial Relations as indicated in the wage rate determinations to obtain predetermined wage changes.

Pursuant to Section 1773.2 of the Labor Code, general prevailing wage rates shall be posted by the Contractor at a prominent place at the site of the work.

Changes in general prevailing wage determinations which conform to Labor Code Section 1773.6 and Title 8 California Code of Regulations Section 16204 shall apply to the project when issued by the Director of Industrial Relations at least 10 days prior to the date of the Notice to Contractors for the project.

The State will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the prevailing wage rate set forth in the contract. The possibility of wage increases is one of the elements to be considered by the Contractor in determining the bid, and will not under any circumstances be considered as the basis of a claim against the State on the contract.

7-1.01A(2)(a) Travel and Subsistence Payments.— Attention is directed to the requirements of Section 1773.8 of the Labor Code. The Contractor shall make travel and subsistence payments to each workman, needed to execute the work, in accordance with the requirements in Labor Code Section 1773.8.

The first and second paragraphs of Section 7-1.01A(3), "Payroll Records," of the Standard Specifications are amended to read:

7-1.01A(3) Payroll Records.— Attention is directed to the provisions of Labor Code Section 1776, a portion of which is quoted below. Regulations implementing Labor Code Section 1776 are located in Sections 16016 through 16019 and Sections 16207.10 through 16207.19 of Title 8, California Code of Regulations.

"1776. (a) Each contractor and subcontractor shall keep accurate payroll records, showing the name, address, social security number, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by him or her

in connection with the public work. Each payroll record shall contain or be verified by a written declaration that it is made under penalty of perjury, stating both of the following:

(1) The information contained in the payroll record is true and correct.

(2) The employer has complied with the requirements of Sections 1771, 1811, and 1815 for any work performed by his or her employees on the public works project.

"(b) The payroll records enumerated under subdivision (a) shall be certified and shall be available for inspection at all reasonable hours at the principal office of the contractor on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records enumerated in subdivision (a) shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through either the body awarding the contract, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to paragraph (2), the requesting party shall, prior to being provided the records, reimburse the costs of preparation by the contractor, subcontractors, and the entity through which the request was made. The public shall not be given access to the records at the principal office of the contractor.

"(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division.

"(d) A contractor or subcontractor shall file a certified copy of the records enumerated in subdivision (a) with the entity that requested the records within 10 days after receipt of a written request.

"(e) Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standards, or the Division of Labor Standards Enforcement shall be marked or obliterated in a manner so as to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated.

"(f) The contractor shall inform the body awarding the contract of the location of the records enumerated under subdivision (a), including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

"(g) The contractor or subcontractor shall have 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section."

The penalties specified in subdivision (g) of Labor Code Section 1776 for noncompliance with the provisions of Section 1776 may be deducted from any moneys due or which may become due to the Contractor.

5-1.03 CONTRACTOR'S LICENSING LAWS

The third paragraph of Section 7-1.01C, "Contractor's Licensing Laws," of the Standard Specifications is amended to read:

Attention is also directed to the provisions of Public Contract Code Section 10164. In all projects where Federal funds are involved, the Contractor shall be properly licensed at the time the contract is awarded.

5-1.04 ARBITRATION

The last paragraph in Section 9-1.10, "Arbitration," of the Standard Specifications is amended to read.

Arbitration shall be initiated by a Complaint in Arbitration made in compliance with the requirements of said regulations. A Complaint in Arbitration by the Contractor shall be made not later than 180 days after the date of service in person or by mail on the Contractor of the final written decision by the Department on the claim.

5-1.05 NOTICE OF POTENTIAL CLAIM

Section 9-1.04, "Notice of Potential Claim," of the Standard Specifications is amended to read:

9-1.04 Notice of Potential Claim.--The Contractor shall not be entitled to the payment of any additional compensation for any act, or failure to act, by the Engineer, including failure or refusal to issue a change order, or for the happening of any event, thing, occurrence, or other cause, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified. Compliance with this Section 9-1.04 shall not be a prerequisite as to matters within the scope of the protest provisions in Section 4-1.03, "Changes," or Section 8-1.06, "Time of Completion," or the notice provisions in Section 5-1.116, "Differing Site Conditions," or Section 8-1.07, "Liquidated Damages," or Section 8-1.10, "Utility and Non-Highway Facilities," nor to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall be submitted to the Engineer prior to the time that the Contractor performs the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing, occurrence, or other cause, giving rise to the potential claim.

The written notice of potential claim shall be submitted on Form CEM-6201 furnished by the Department and shall be certified with reference to the California False Claims Act, Government Code Sections 12650 - 12655. The notice shall set forth the reasons for which the Contractor believes additional compensation will or may be due and the nature of the costs involved. Unless the amount of the potential claim has been stated in the written notice, the Contractor shall, within 15 days of submitting said notice, furnish an estimate of the cost of the affected work and impacts, if any, on project completion. Said estimate of costs may be changed or updated by the Contractor when conditions have changed. When the affected work is completed, the Contractor shall submit substantiation of his actual costs. Failure to do so shall be sufficient cause for denial of any claim subsequently filed on the basis of said notice of potential claim.

It is the intention of this Section 9-1.04 that differences between the parties arising under and by virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

Should the Contractor, in connection with or subsequent to the assertion of a potential claim, request inspection and copying of documents or records in the possession of the Department that pertain to the potential claim, Contractor shall make its records of the project, as deemed by the Department to be pertinent to the potential claim, available to the Department for inspection and copying.

5-1.06 PARTIAL PAYMENTS

The last paragraph of Section 9-1.06, "Partial Payments," of the Standard Specifications is amended to read:

Attention is directed to the prohibitions and penalties pertaining to unlicensed contractors as provided in Business and Professions Code Sections 7028.15(a) and 7031.

5-1.07 PAYMENT OF WITHHELD FUNDS

Section 9-1.065, "Payment of Withheld Funds," of the Standard Specifications, is amended by adding the following after the third paragraph:

Alternatively, and subject to the approval of the Department, the payment of retentions earned may be deposited directly with a person licensed under Division 6 (commencing with Section 17000) of the Financial Code as the escrow agent. Upon written request of an escrow agent that has not been approved by the Department under subdivision (c) of Section 10263 of the Public Contract Code, the Department will provide written notice to that escrow agent within 10 business days of receipt of the request indicating the reason or reasons for not approving that escrow agent. The payments will be deposited in a trust account with a Federally chartered bank or savings association within 24 hours of receipt by the escrow agent. The Contractor shall not place any retentions with the escrow agent in excess of the coverage provided to that escrow agent pursuant to subdivision (b) of Section 17314 of the Financial Code. In all respects not inconsistent with subdivision (c) of Section 10263 of the Public Contract Code, the remaining provisions of Section 10263 of the Public Contract Code shall apply to escrow agents acting pursuant to subdivision (c) of Section 10263 of the Public Contract Code.

5-1.08 FINAL PAYMENT AND CLAIMS

Section 9-1.07B, "Final Payment and Claims," of the Standard Specifications is amended to read:

9-1.07B Final Payment and Claims.--After acceptance by the Director, the Engineer will make a proposed final estimate in writing of the total amount payable to the Contractor, including therein an itemization of said

amount, segregated as to contract item quantities, extra work and any other basis for payment, and shall also show therein all deductions made or to be made for prior payments and amounts to be kept or retained under the provisions of the contract. All prior estimates and payments shall be subject to correction in the proposed final estimate. The Contractor shall submit written approval of the proposed final estimate or a written statement of all claims arising under or by virtue of the contract so that the Engineer receives such written approval or statement of claims no later than close of business of the thirtieth day after receiving the proposed final estimate. If the thirtieth day falls on a Saturday, Sunday or legal holiday, then receipt of such written approval or statement of claims by the Engineer shall not be later than close of business of the next business day. No claim will be considered that was not included in the written statement of claims, nor will any claim be allowed as to which a notice or protest is required under the provisions in Sections 4-1.03, "Changes," 8-1.06, "Time of Completion," 8-1.07, "Liquidated Damages," 5-1.116, "Differing Site Conditions," 8-1.10, "Utility and Non-Highway Facilities," and 9-1.04, "Notice of Potential Claim," unless the Contractor has complied with the notice or protest requirements in said sections.

On the Contractor's approval, or if he files no claim within said period of 30 days, the Engineer will issue a final estimate in writing in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the entire sum so found to be due. Such final estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

If the Contractor within said period of 30 days files claims, the Engineer will issue a semifinal estimate in accordance with the proposed final estimate submitted to the Contractor and within 30 days thereafter the State will pay the sum so found to be due. Such semifinal estimate and payment thereon shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except insofar as affected by the claims filed within the time and in the manner required hereunder and except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

Claims filed by the Contractor shall be in sufficient detail to enable the Engineer to ascertain the basis and amount of said claims. If additional information or details are required by the Engineer to determine the basis and amount of said claims, the Contractor shall furnish such further information or details so that the information or details are received by the Engineer no later than the fifteenth day after receipt of the written request from the Engineer. If the fifteenth day falls on a Saturday, Sunday or legal holiday, then receipt of such information or details by the Engineer shall not be later than close of business of the next business day. Failure to submit such information and details to the Engineer within the time specified will be sufficient cause for denying the claim.

The Contractor shall keep full and complete records of the costs and additional time incurred for any work for which a claim for additional compensation is made. The Engineer or any designated claim investigator or auditor shall have access to those records and any other records as may be required by the Engineer to determine the facts or contentions involved in the claims. Failure to permit access to such records shall be sufficient cause for denying the claims.

Claims submitted by the Contractor shall be accompanied by a notarized certificate containing the following language:

Under the penalty of law for perjury or falsification and with specific reference to the California False Claims Act, Government Code Section 12650 et. seq., the undersigned,

(name) _____ of

(title) _____

(company)

hereby certifies that the claim for the additional compensation and time, if any, made herein for the work on this contract is a true statement of the actual costs incurred and time sought, and is fully documented and supported under the contract between parties.

Dated _____

/s/ _____

Subscribed and sworn before me this _____ day

of _____

Notary Public

My Commission Expires _____

Failure to submit the notarized certificate will be sufficient cause for denying the claim.

Any claim for overhead type expenses or costs, in addition to being certified as stated above, shall be supported by an audit report of an independent Certified Public Accountant. Any such overhead claim shall also be subject to audit by the State at its discretion.

Any costs or expenses incurred by the State in reviewing or auditing any claims that are not supported by the Contractor's cost accounting or other records shall be deemed to be damages incurred by the State within the meaning of the California False Claims Act.

The District Director of the District which administers the contract will make the final determination of any claims which remain in dispute after completion of claim review by the Engineer. A board or person designated by said District Director will review such claims and make a written recommendation thereon to the District Director. The Contractor may meet with the review board or person to make a presentation in support of such claims.

Upon final determination of the claims, the Engineer will then make and issue his final estimate in writing and within 30 days thereafter the State will pay the entire sum, if any, found due thereon. Such final estimate shall be conclusive and binding against both parties to the contract on all questions relating to the amount of work done and the compensation payable therefor, except as otherwise provided in Sections 9-1.03C, "Records," and 9-1.09, "Clerical Errors."

5-1.09 INTEREST ON PAYMENTS

Interest shall be payable on progress payments, payments after acceptance, final payments, extra work payments and claim payments as follows:

1. Unpaid progress payments, payment after acceptance and final payments shall begin to accrue interest 30 days after the Engineer prepares the payment estimate.
2. Unpaid extra work bills shall begin to accrue interest 30 days after preparation of the first pay estimate following the receipt of a properly submitted and undisputed extra work bill. To be properly submitted, the bill must be submitted within 7 days of the performance of the extra work and in accordance with the requirements of Section 9-1.03C, "Records," and Section 9-1.06, "Partial Payments," of the Standard Specifications. An undisputed extra work bill not submitted within 7 days of performance of the extra work will begin to accrue interest 30 days after the preparation of the second pay estimate following submittal of the bill.
3. The rate of interest payable for unpaid progress payments, payments after acceptance, final payments and extra work payments shall be 10 percent per annum.
4. The rate of interest payable on a claim, protest or dispute ultimately allowed under this contract shall be 6 percent per annum. Interest shall begin to accrue 61 days after the Contractor submits to the Engineer information in sufficient detail to enable the Engineer to ascertain the basis and amount of said claim, protest or dispute.

The rate of interest payable on any award in arbitration shall be 6 percent per annum if allowed under the provisions of Civil Code Section 3289.

5-1.10 PUBLIC SAFETY

The Contractor shall provide for the safety of traffic and the public in accordance with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications and these special provisions.

The Contractor shall install temporary railing (Type K) between any lane carrying public traffic and any excavation, obstacle, or storage area when the following conditions exist:

- (1) Excavations.--Any excavation, the near edge of which is 12 feet or less from the edge of the lane, except:

- (a) Excavations covered with sheet steel or concrete covers of adequate thickness to prevent accidental entry by traffic or the public.
- (b) Excavations less than one foot deep.
- (c) Trenches less than one foot wide for irrigation pipe or electrical conduit, or excavations less than one foot in diameter.
- (d) Excavations parallel to the lane for the purpose of pavement widening or reconstruction.
- (e) Excavations in side slopes, where the slope is steeper than 4:1.
- (f) Excavations protected by existing barrier or railing.

(2) Temporarily Unprotected Permanent Obstacles.--Whenever the work includes the installation of a fixed obstacle together with a protective system, such as a sign structure together with protective railing, and the Contractor elects to install the obstacle prior to installing the protective system; or whenever the Contractor, for his convenience and with permission of the Engineer, removes a portion of an existing protective railing at an obstacle and does not replace such railing complete in place during the same day.

(3) Storage Areas.--Whenever material or equipment is stored within 12 feet of the lane and such storage is not otherwise prohibited by the specifications.

The approach end of temporary railing (Type K), installed in accordance with the requirements in this section "Public Safety" and in Section 7-1.09, "Public Safety," of the Standard Specifications shall be offset a minimum of 15 feet from the edge of the traffic lane open to public traffic. The temporary railing shall be installed on a skew toward the edge of the traffic lane of not more than one foot transversely to 10 feet longitudinally with respect to the edge of the traffic lane. If the 15-foot minimum offset cannot be achieved, the temporary railing shall be installed on the 10 to 1 skew to obtain the maximum available offset between the approach end of the railing and the edge of the traffic lane, and an array of temporary crash cushion modules shall be installed at the approach end of the temporary railing.

Temporary railing (Type K) shall conform to the provisions in Section 12-3.08, "Temporary Railing (Type K)" of the Standard Specifications, except temporary railing (Type K) fabricated prior to January 1, 1993, with one longitudinal No. 5 reinforcing steel bar near the top in lieu of the 2 longitudinal No. 5 reinforcing steel bars near the top, as shown on the plans, may be used.

Temporary crash cushion modules shall conform to the provisions in "Temporary Crash Cushion Module" elsewhere in these special provisions.

Except for installing, maintaining and removing traffic control devices, whenever work is performed or equipment is operated in the following work areas the Contractor shall close the adjacent traffic lane unless otherwise provided in the specifications:

Approach speed of public traffic (Posted Limit) (Miles Per Hour)	Work Areas
Over 45	Within 6 feet of a traffic lane but not on a traffic lane.
35 to 45	Within 3 feet of a traffic lane but not on a traffic lane.

The lane closure provisions of this section shall not apply if the work area is protected by permanent or temporary railing or barrier.

When traffic cones or delineators are used to delineate a temporary edge of traffic lane, the line of cones or delineators shall be considered to be the edge of traffic lane, however, the Contractor shall not reduce the width of an existing lane to less than 10 feet without written approval from the Engineer.

When work is not in progress on a trench or other excavation that required closure of an adjacent lane, the traffic cones or portable delineators used for the lane closure shall be placed off of and adjacent to the edge of the traveled way. The spacing of the cones or delineators shall be not more than the spacing used for the lane closure.

Suspended loads or equipment shall not be moved nor positioned over public traffic or pedestrians.

Full compensation for conforming to the requirements in this section "Public Safety," including furnishing and installing temporary railing (Type K) and temporary crash cushion modules, shall be considered as included in the contract prices paid for the various items of work involved and no additional compensation will be allowed therefor.

5-1.11 SURFACE MINING AND RECLAMATION ACT

Attention is directed to the Surface Mining and Reclamation Act of 1975, commencing in Public Resources Code, Mining and Geology, Section 2710, which establishes regulations pertinent to surface mining operations.

Material from mining operations furnished for this project shall only come from permitted sites in compliance with the Surface Mining and Reclamation Act of 1975.

The requirements of this section shall apply to all materials furnished for the project, except for acquisition of materials in conformance with Section 4-1.05, "Use of Materials Found on the Work," of the Standard Specifications.

5-1.12 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe, and shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In accordance with Section 25914.1 of the Health and Safety Code, all such removal of asbestos or hazardous substances including any exploratory work to identify and determine the extent of such asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for such delay as provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

5-1.13 FINAL PAY QUANTITIES

Section 9-1.015, "Final Pay Quantities," of the Standard Specifications is amended to read:

9-1.015 Final Pay Items.—When an item of work is designated as (F) or (S-F) in the Engineer's Estimate, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated. If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions, except as otherwise provided for minor structures in Section 51-1.22, "Measurement." If a final pay item is eliminated, the estimated quantity for the item will be eliminated. If a portion of a final pay item is eliminated, the final pay quantity will be revised in the amount represented by the eliminated portion of the item of work.

The estimated quantity for each item of work designated as (F) or (S-F) in the Engineer's Estimate shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.

In case of discrepancy between the quantity shown in the Engineer's Estimate for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown in the Engineer's Estimate.

5-1.14 YEAR 2000 COMPLIANCE

This contract is subject to Year 2000 Compliance for automated devices in the State of California. Year 2000 compliance is defined as follows:

Year 2000 compliance for automated devices in the State of California is achieved when embedded functions have or create no logical or mathematical inconsistencies when dealing with dates prior to and beyond 1999. The year 2000 is recognized and processed as a leap year. The product must also operate accurately in the manner in which it was intended for date operation without requiring manual intervention.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all automated devices furnished for the project.

5-1.15 DVBE RECORDS

The Contractor shall maintain records of all subcontracts entered into with certified DVBE subcontractors and records of materials purchased from certified DVBE suppliers. Such records shall show the name and business address of each DVBE subcontractor or vendor and the total dollar amount actually paid each DVBE subcontractor or vendor.

Upon completion of the contract, a summary of these records shall be prepared on Form CEM-2402 and certified correct by the Contractor or his authorized representative, and shall be furnished to the Engineer.

5-1.155 PERFORMANCE OF DVBE SUBCONTRACTORS AND SUPPLIERS

The DVBEs listed by the Contractor in response to the requirements in Section 2-1.04, "Submission of DVBE Information," in these special provisions, which are determined by the Department to be certified DVBEs, shall perform the work and supply the materials for which they are listed unless the Contractor has received prior written authorization to perform the work with other forces or to obtain the materials from other sources.

Authorization to utilize other forces or sources of materials may be requested for the following reasons:

(1) The listed DVBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract, when such written contract, based upon the general terms, conditions, plans and specifications for the project, or on the terms of such subcontractor's or supplier's written bid, is presented by the Contractor.

(2) The listed DVBE becomes bankrupt or insolvent.

(3) The listed DVBE fails or refuses to perform his subcontract or furnish the listed materials.

(4) The Contractor stipulated that a bond was a condition of executing a subcontract and the listed DVBE subcontractor fails or refuses to meet the bond requirements of the Contractor.

(5) The work performed by the listed subcontractor is substantially unsatisfactory and is not in substantial accordance with the plans and specifications, or the subcontractor is substantially delaying or disrupting the progress of the work.

(6) The listed DVBE subcontractor is not licensed pursuant to the Contractors License Law.

(7) It would be in the best interest of the State.

The Contractor shall not be entitled to any payment for such work or material unless it is performed or supplied by the listed DVBE or by other forces (including those of the Contractor) pursuant to prior written authorization of the Engineer.

5-1.16 SUBCONTRACTING

Attention is directed to the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, Section 2, "Proposal Requirements and Conditions," Section 2-1.04, "Submission of DVBE Information," and Section 3, "Award and Execution of Contract," elsewhere in these special provisions and these special provisions.

The second sentence in the third paragraph of said Section 8-1.01 is amended to read:

When items of work in the Engineer's Estimate are preceded by the letters (S) or (S-F), said items are designated as "Specialty Items."

The DVBE information furnished under Section 2-1.04, "Submission of DVBE Information," of these special provisions is in addition to the subcontractor information required to be furnished under said Section 8-1.01, "Subcontracting," and Section 2-1.054, "Required Listing of Proposed Subcontractors," of the Standard Specifications.

Section 10115 of the Public Contract Code requires the Department to implement provisions to establish a goal for Disabled Veteran Business Enterprise (DVBE) participation in highway contracts that are state funded. As a part of this requirement:

1. No substitution of a DVBE subcontractor shall be made at any time without the written consent of the Department, and

2. If a DVBE subcontractor is unable to perform successfully and is to be replaced, the Contractor will be required to make good faith efforts to replace the original DVBE subcontractor with another DVBE subcontractor.

The requirement in Section 2-1.02, "Disabled Veteran Business Enterprise (DVBE)," of these special provisions that DVBEs must be certified on the date bids are opened does not apply to DVBE substitutions after award of the contract.

5-1.17 PARTNERING

The State will promote the formation of a "Partnering" relationship with the Contractor in order to effectively complete the contract to the benefit of both parties. The purpose of this relationship will be to maintain cooperative communication and mutually resolve conflicts at the lowest possible management level.

The Contractor may request the formation of such a "Partnering" relationship by submitting a request in writing to the Engineer after approval of the contract. If the Contractor's request for "Partnering" is approved by the Engineer, scheduling of a "Partnering" workshop, selecting the "Partnering" facilitator and workshop site, and other administrative details shall be as agreed to by both parties.

The costs involved in providing a facilitator and a workshop site will be borne equally by the State and the Contractor. The Contractor shall pay all compensation for the wages and expenses of the facilitator, and of the expenses for obtaining the workshop site. The State's share of such costs will be reimbursed to the Contractor in a change order

written by the Engineer. Markups will not be added. All other costs associated with the "Partnering" relationship will be borne separately by the party incurring the costs.

The establishment of a "Partnering" relationship will not change or modify the terms and conditions of the contract and will not relieve either party of the legal requirements of the contract.

5-1.18 PAYMENTS

Attention is directed to Section 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications and these special provisions.

For the purpose of making partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications, the amount set forth for the contract items of work hereinafter listed shall be deemed to be the maximum value of said contract item of work which will be recognized for progress payment purposes.

Electronic Mobile Daily Diary Computer System	\$63,000
Clearing and Grubbing	\$9,000

After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," of the Standard Specifications, the amount, if any, payable for a contract item of work in excess of the maximum value for progress payment purposes hereinabove listed for said item, will be included for payment in the first estimate made after acceptance of the contract.

In determining the partial payments to be made to the Contractor, only the following listed materials will be considered for inclusion in said payment as materials furnished but not incorporated in the work:

- Tiedown anchors
- Bar reinforcing steel
- Miscellaneous metal
- Culvert pipe and appurtenances
- Overside drains and appurtenances
- Miscellaneous iron and steel
- Crash cushions
- Pavement markers

5-1.19 SOUND CONTROL REQUIREMENTS

Sound control shall conform to the provisions in Section 7-1.01I, "Sound Control Requirements," of the Standard Specifications and these special provisions.

The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dbA at a distance of 50 feet. This requirement in no way relieves the Contractor from responsibility for complying with local ordinances regulating noise level.

Said noise level requirement shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by the Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety laws for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

5-1.20 RELATIONS WITH UNITED STATES NAVY

A portion of this project is located within the jurisdiction of the United States Navy. An agreement regarding crossing of the San Francisco-Oakland Bay Bridge over Yerba Buena Island has been entered into by the State of California and the United States Navy. The Contractor shall fully inform himself of the requirements of this agreement as well as all rules, regulations, and conditions that may govern his operations in said area and shall conduct his operations accordingly.

Copies of the agreement may be obtained at the Department of Transportation, Plans and Bid Documents, Room 0200, Transportation Building, 1120 N Street, P. O. Box 942874, Sacramento, California 94274-0001, Telephone No. (916) 654-4490, and are available for inspection at the office of the District Director of Transportation at 111 Grand Avenue, Oakland, California 94601. Please call the Construction Office Duty Senior, Telephone No. (510) 286 - 5209, to reserve a copy at least 24 hours in advance.

Any modifications to the agreement between the Department of Transportation and Department of the Navy which are proposed by the Contractor shall be submitted in writing to the Engineer for transmittal to the Department of the Navy for their consideration.

When the Contractor is notified by the Engineer that a modification to the agreement is under consideration, no work will be allowed which is inconsistent with the proposed modification until the Departments take action on the proposed

modifications. Compensation for delay will be determined in accordance with Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

Any modifications to any agreement between the Department of Transportation and the Department of the Navy will be fully binding on the Contractor, and the provisions of this section shall be made a part of every subcontract executed pursuant to this contract.

5-1.21 CONTAMINATED AND HAZARDOUS MATERIAL, GENERAL

Attention is directed to "Earthwork" of these special provisions regarding the removal and disposal of contaminated and hazardous material.

Contaminated and hazardous material have been discovered through testing within the project limits. Portions of the test results are included in the "Materials Information." The complete report entitled "Subsurface Soil Investigation San Francisco - Oakland Bay Bridge/Yerba Buena Island" is available for inspection at the Department of Transportation, Duty Senior's Desk, 111 Grand Avenue, Oakland, California, (510) 286-5549. The levels of contaminants in material designated as hazardous in the plans or in these special provisions characterize the material as hazardous waste as defined by State of California regulations. The materials are not regulated under the federal Resource Conservation and Recovery Act (RCRA). The levels of contaminants in material designated as contaminated in the plans or these special provisions characterize the material as nonhazardous waste as defined by State of California regulations.

Hazardous materials shall be transferred directly from the excavation to a registered transport vehicle, a storage container approved for transport of hazardous waste by the United States Department of Transportation, or a stockpile location approved by the Engineer. Stockpile locations shall be maintained in accordance with the following requirements:

The material shall not contain free liquids that separate readily from the material. The presence or absence of free liquids shall be demonstrated by United States Environmental Protection Agency Method 9095 as modified by Section 66264.314 of Title 22 of the California Code of Regulations (CCR).

The material shall be stored on undamaged 60-mil high density polyethylene or an equivalent impermeable barrier unless the stockpiling location is on a paved surface. If the location is on a paved surface the thickness of the barrier can be reduced to 20-mil high density polyethylene or its equivalent. The dimensions of the barrier shall exceed the dimensions of the stockpile at all times. Any seams in the barrier shall be sealed to prevent leakage.

At the end of each day the material shall be covered with undamaged 12-mil polyethylene or an equivalent impermeable barrier to prevent windblown dispersion and precipitation run-off and run-on. When more than one sheet is required to cover the material, the sheets shall be overlapped a minimum of 1.5 feet in a manner that prevents water from flowing onto the material. The cover shall be secured in a manner that keeps it in place at all times. Driven anchors shall not be used except at the perimeter of the stockpile. The cover shall be inspected and maintained in accordance with the requirements of "Water Pollution Control" of these special provisions.

These stockpiling requirements apply to all temporary storage of hazardous material outside of an excavation or a transport container including, but not limited to, staging of excavated material next to the excavation prior to pick up by loading equipment, accumulating material for full transport loads, and awaiting test results required by a disposal facility. The removal of stockpiles shall begin within 30 days of accumulating 100 kg of hazardous material. After final removal has occurred the Contractor shall be responsible for any cleanup deemed necessary by the Engineer.

All contaminated material and hazardous material on exteriors of transport vehicles shall be removed and placed either into the current transport vehicle or the excavation prior to the vehicle leaving the exclusion zone. No contaminated material or hazardous material shall be deposited on public roads. The Contractor shall indemnify the State from any costs due to spillage during the transport of the contaminated or hazardous material to the disposal facility.

The Contractor shall monitor the air quality continuously during excavation operations at all locations containing hazardous material.

Disposal of additional material resulting from the Contractor's option to slope the excavations in lieu of shoring at locations where this is possible or any excavation operations outside structure excavation pay limits will be at the Contractor's expense. This resultant material shall be treated as either contaminated material or hazardous material if the test results for the location indicate that the material being excavated is contaminated or hazardous.

APPLICABLE RULES AND REGULATIONS.--Excavation, transport and disposal of contaminated material and hazardous material shall be in accordance with the rules and regulations of the following agencies:

United States Department of Transportation (USDOT)
United States Environmental Protection Agency (USEPA)
California Environmental Protection Agency (CAL-EPA)

1. Department of Toxic Substance Control (DTSC)
2. Integrated Waste Management Board
3. Regional Water Quality Control Board, Region 2 (RWQCB)
4. State Air Resources Board

Bay Area Air Quality Management District (BAAQMD)
California Division of Occupational Safety and Health Administration (CAL-OSHA)

PERMITS AND LICENSES.--The Contractor shall procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work, including registration for transporting vehicles carrying the contaminated material and the hazardous material. The California Environmental Quality Act (CEQA) of 1970 (Chapter 1433, Stats. 1970), as amended may be applicable to permits, licenses and authorizations which the Contractor shall obtain from all agencies in connection with performing the work of the contract. The Contractor shall comply with the provisions of said statutes in obtaining such permits, licenses and other authorizations.

The Engineer will obtain the Environmental Protection Agency Generator Identification No. and Board of Equalization Identification Number as the State is the Generator.

HEALTH, SAFETY AND WORK PLAN.--The Contractor shall prepare a detailed Health, Safety and Work Plan for all site personnel in accordance with the DTSC and CAL-OSHA regulations. The Health, Safety and Work Plan shall include a plot plan indicating the exclusion zones, contaminant reduction zones, and support zones, as described in the Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities published by the National Institute for Occupational Safety and Health, Occupational Safety and Health Administration, U.S. Coast Guard, and USEPA; an air monitoring plan; and site clean up procedures. The Health, Safety and Work Plan shall be submitted at least 15 working days prior to beginning any work for review and acceptance by the Engineer. Prior to submittal, the Contractor shall have the Health, Safety and Work Plan approved by a Civil Engineer, registered in the State of California and by a Certified Industrial Hygienist .

SAFETY.--Prior to performing any work at the locations that potentially contain material classified as hazardous, all personnel, including State Personnel, shall complete a safety training program which meets the requirements of Section 1910.120 of Title 29 of the Code of Federal Regulations and Sections 5192 and 5194 of Title 8 of the CCR covering the potential hazards as identified. The training shall be provided by the Contractor. The Contractor shall provide a certification of completion of the Safety Training Program to all personnel. Any personal protective equipment and medical surveillance required by the Contractor's Health, Safety and Work Plan for personnel working within the exclusion zone will be supplied to State personnel by the Contractor. The number of State personnel requiring the above mentioned safety training program, personal protective equipment, and medical surveillance will be 5.

The decontamination area shall be located outside of the exclusion zone. Water from decontamination procedures shall be collected and disposed of at an appropriate disposal site by the Contractor. Non-reusable protective equipment, once used by any personnel, including State personnel, shall be collected and disposed of at an appropriate disposal site by the Contractor.

SAMPLING AND ANALYSIS.--The Contractor shall test the material to be excavated at his own expense for any additional acceptance requirements put forth by the disposal facility. Sampling and analysis shall be performed using the sampling and analysis procedure required by the disposal facility and approved by the Engineer.

The Contractor may perform additional tests on the material to be excavated at his option and expense for confirmation of the material classification as contaminated or hazardous. Sampling and analysis shall be the same or equivalent tests specified in the "Materials Information." The Contractor shall submit for approval by the Engineer, his sampling and analysis procedure and the name and address of the laboratory to be used fifteen working days prior to beginning any sampling or analysis. The laboratory used shall be certified by the California Department of Health Services.

MEASUREMENT AND PAYMENT.--Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work affected by this section and no additional compensation will be allowed therefor.

5-1.22 ELECTRONIC MOBILE DAILY DIARY COMPUTER SYSTEM

The Contractor shall provide for the State's exclusive possession and use a complete electronic mobile daily diary computer system, to allow State personnel to record observation (diary) data in the field using Personal Digital Assistants (PDAs), and in the office using desktop workstations. Recorded data will be uploaded to a database maintained on an Oracle server. Diary information in the database shall be capable of being edited and printed in the form of an Engineer's

Daily Report from desktop workstations connected to the database via a local area network. The system shall also provide other reports required by the Engineer, as well as user friendly and rapid retrieval of daily reports and other information from the database for research purposes.

The Engineer may use the furnished computer hardware, software, and instruction manual for any purposes related to the subject project. Before delivery and set up of the computer system the Contractor shall submit to the Engineer for approval a detailed list of all computer hardware and software the Contractor proposes to furnish. All computer hardware and software furnished shall remain the property of the Contractor and shall be removed by the Contractor upon acceptance of the contract when no claims are pending and after the final estimate has been submitted to the Contractor.

The electronic mobile daily diary computer system furnished shall meet the requirements described below for function, data, hardware, and support.

FUNCTIONAL REQUIREMENTS.--The Contractor shall provide, not later than 11 days after contract award, a computer system that complies with the following minimum functional specifications:

DATA COLLECTION SUBSYSTEM.--

1. Accept input of observation data on a pen-based, hand-held computer (PDA).

General Data.--Allow input of data that applies to all observation data sets:

- Inspector ID: agency-specific code; allow up to 10 alphanumeric characters.
- Inspector password: general text field; allow up to 10 characters.
- Inspector name: general text field; allow up to 30 characters.
- Inspector title: general text field; allow up to 30 characters.

Daily Contract Observation Data.--Collect one or more contract observation data sets per contract per inspector per day:

- Observation date: month, day & year.
- Contract ID: agency-specific code; allow up to 15 alphanumeric characters.
- Uniqueness guarantor: time and time of creation of the data set.
- Weather condition, a.m. and p.m.: agency-specific code of up to 10 alphanumeric characters.
- Temperature, high and low: signed numeric value of up to 3 digits (degrees Fahrenheit or Celsius).
- Humidity, high and low: percentage value (0 to 100%).
- Start and stop time for inspector shift (24-hour clock; values at the half hour).
- Start and stop time for jobsite shift (24-hour clock; values at the half hour).
- Level of inspection: values are "continuous", "intermittent" and "no inspection".
- Inspector signature: digital image of signature.

Laborer Observation Data.--Collect multiple labor observations per observation data set:

- Contract item or Contract Change Order (CCO): sequential number; allow up to 6 digits.
- Contractor ID: agency-specific code; allow up to 10 alphanumeric characters.
- Critical Path Method network (CPM) activity code: agency-specific code; allow up to 10 alphanumeric characters.
- Laborer name: last, first, & middle initial.
- Labor classification: agency-specific code; allow up to 10 alphanumeric characters.
- Trainee status: Boolean value.
- Hours: numeric value (0 to 24; up to 2 places behind the decimal point).
- Hours type flag: flag value to indicate regular vs. overtime hours.
- Force account flag: Boolean value (CCO observations only).

Equipment Observation Data.--Collect multiple equipment observations per observation data set:

- Contract item or CCO: sequential number; allow up to 6 digits.
- Contractor ID: agency-specific code; allow up to 10 alphanumeric characters.
- CPM activity code: agency-specific code; allow up to 10 alphanumeric characters.
- Equipment ID: Contractor-specific code; allow up to 10 alphanumeric characters.
- Equipment description ("new" equipment only): general text field; allow up to 60 characters.
- Rental status: Boolean value.

- Hours: numeric value (0 to 24; up to 2 places behind the decimal point).
- Hours type flag: flag value to indicate regular vs. overtime vs. idle hours.
- Force account flag: Boolean value (CCO observations only).

Pay Items Observation Data.--Collect multiple pay items observations per observation data set:

- Contract item or CCO: sequential number; allow up to 6 digits.
- Contractor ID: agency-specific code; allow up to 10 alphanumeric characters.
- CPM activity code: agency-specific code; allow up to 10 alphanumeric characters.
- Location/Station: general text field; allow up to 60 characters.
- Load ticket ID: Contractor-specific value; allow up to 15 alphanumeric characters.
- Quantity: numeric value; floating point (11,2) specification.
- Lot number: Contractor-specific value; allow up to 15 alphanumeric characters.
- Lab release number: Contractor-specific value; allow up to 15 alphanumeric characters.
- Force account flag: Boolean value (CCO observations only).
- Units type (force account observations only): agency-specific code; allow up to 10 alphanumeric characters.
- Material type (force account observations only): general text field; allow up to 60 characters.

Remarks Data.--Collect multiple remarks per observation data set:

- Contract item or CCO (optional): sequential number; allow up to 6 digits.
- Contractor ID (optional): agency-specific code; allow up to 10 alphanumeric characters.
- CPM activity code: agency-specific code; allow up to 10 alphanumeric characters.
- Remark type: agency-specific code; allow up to 10 alphanumeric characters.
- Remark text: general text field; allow up to 1950 characters.
- Force account flag: Boolean value (CCO observations only).

2. Provide meaningful display of coded information.

- Display contract descriptions in addition to contract numbers.
- Display item/CCO descriptions in addition to item/CCO numbers.
- Display CPM activity descriptions in addition to CPM activity codes.
- Display Contractor names in addition to Contractor IDs.
- Display equipment descriptions in addition to equipment IDs.
- Display labor classification descriptions in addition to labor classification codes.
- Display material types and units of measure based on contract item number.
- Display remark type descriptions in addition to remark type code.
- Display weather condition descriptions in addition to weather condition codes.

3. Facilitate entry of inspection data.

In general, methods of data entry shall require the minimum number of actions from the user as is practical.

- Provide pick lists from the central database for entry of the following fields:
 - Contract numbers.
 - Contract item numbers.
 - Contractor IDs.
 - CPM activity codes.
 - Laborers.
 - Labor classifications.
 - Equipment.
 - Remark types.
 - Weather conditions (a.m. and p.m.).

Also provide alphabetical tabs for navigating the list of laborer.

- Provide option of handwriting or typewriter keypad entry for the following fields:
 - Inspector ID, password, name, and title.
 - Load ticket number.
 - Lot number.
 - Lab release number.
 - Materials location.

- Remark text.
 - Laborer name for “new” people.
 - Equipment ID and description for “new” equipment.
- Provide option of handwriting or numeric keypad entry for the following fields:
 - Contract item number.
 - CPM activity codes.
 - Materials quantity.
 - Temperatures (high and low).
 - Humidity (high and low).
 - Provide “clock” controls for entry of the following fields:
 - Inspector shift hours.
 - Jobsite shift hours.
 - Hours (labor & equipment observations).
 - Provide calendar keypad entry for the following fields:
 - Observation date.
 - Provide checkboxes for entry of the following Boolean fields:
 - Trainee status.
 - Rental status.
 - Force account status.
 - Provide radio buttons for entry of the following fields:
 - Hours type flag (regular, overtime, idle).
 - Provide popup menu for entry of the following fields:
 - Level of inspection.
 - Copy into labor & equipment observations relevant ratebook codes and values from the central database.
 - Provide option to use handwriting or typewriter keypad to enter equipment ID for equipment observations and look up the corresponding piece of equipment, as an alternative to choosing the piece of equipment from a list.
 - Provide option to change the labor classification for a labor observation even if the laborer name and classification have been selected from a list (to allow observations of laborers working out of their normal classes).
4. Store observation data sets.
- Store all entered data on the mobile platform for up to 100 observations (any combination of types) per contract observation data set.
 - Store data for up to 30 observation data sets on the mobile platform.
 - Store or backup data on non-volatile memory to guard against data loss.
5. Support review and modification of observation data sets.
- Allow user to select observation data sets from a list by identifying:
 - Engineer ID.
 - Observation date.
 - Contract number.
 - Once a data set is selected, display all observation entries in an overview list. Allow list to be sorted by observation type, contract item, or Contractor. Also allow list to be restricted by observation type (labor, equipment, materials, or remarks) so that additional data can be displayed for the observations (e.g., labor name, hours & hours type for labor entries).
 - Provide option to duplicate observation entries from the list, optionally setting item number & hours fields to new values.
 - Allow list entries to be selected and edited.
 - Allow user to update weather condition and shift hour data.

- Allow user to duplicate entire observation data sets to a new date selected by the user.
 - Allow user to delete observation data sets (after confirmation).
6. Communicate with database server to upload diaries and download control tables.
- Allow user to mark diaries as “done” and collect a signature image at that time. After the diary has been signed, prohibit any other modifications to the diary. If diary is marked “undone” then allow modifications but throw away signature, so that a new signature is always required at whatever point the diary is marked “done” (i.e., ready for transmission).
 - Connect to communications server via direct serial connection, providing database user ID and password.
 - Send observation data.
 - Select for transmission all observation data sets marked “done” that have not yet been transmitted.
 - Output a serial stream containing the observation data sets to be transmitted.
 - Display status during transmission and provide confirmation that data was sent to the server.
 - Set a flag in transmitted data sets to indicate that they have been transmitted.
 - Be capable of handling unexpected interruptions in the communication link.
 - Receive control table data.
 - Automatically request all necessary control table downloads, providing both user ID and date of last download.
 - Accept a serial stream containing control table updates.
 - Display status during transmission and provide confirmation that data was received from the server.
 - Set the date of last update for received control tables.
 - Be capable of handling unexpected interruptions in the communication link.
7. Provide additional productivity support.
- Display a list of names with addresses, phone numbers, radio call numbers and vehicle IDs. List entries must be transparently downloaded from a central database along with other control table data.
 - Provide word processor application that can be used with external keyboard.
 - Provide spreadsheet application.
 - Provide a calendar and appointment application.
 - Provide a programmable scientific calculator option.
8. Provide adequate hardware functionality for hand-held computer.
- Allow data (other than signature image) to be entered with choice of either pen, on-screen-pad keyboard, or external keyboard.
 - Weigh less than 2 pounds.
 - Battery to have a life of at least 4 continuous hours between chargings.
 - Provide “instant on” capability.
 - Operate within a temperature range of 32 to 104 degrees Fahrenheit (similar to most electronic calculators).
 - Backlit screen

DATABASE COMMUNICATION SUBSYSTEM.--

1. Connect to mobile platform and database server:
- Connect to mobile platform via direct serial connection.
 - Accept database user ID and password from mobile platform.
 - Use the user ID and password to connect to Oracle database for read/write access, either locally or across a local area network.
2. Upload observation data.
- Accept upload requests and data from the mobile device.
 - Drive data recognition and database write functions from an editable configuration file.
 - Write observation data to an Oracle database.
 - Be capable of handling unexpected interruptions in the communication link.

3. Download control data.
 - Accept download requests from the mobile device.
 - Drive data selection and database read functions from an editable configuration file and information (user ID and date of last download) supplied by the mobile device, to limit downloads to only the required data.
 - Read information from an Oracle database and output it to the mobile device.
 - Be capable of handling unexpected interruptions in the communication link.
4. Output audit and debugging data.
 - Provide an option to create archive files for data uploads.
 - Provide an option to create trace file output for data uploads.
5. Provide status/feedback on server operations.
 - Display status and information regarding in-progress data transmissions.
 - Provide optional trace window to display low-level actions of the server application in readable form.
6. Allow administrator to control the server application.
 - Allow administrator to start/stop communication activity.
 - Allow administrator to select connection port and configuration file.
 - Allow administrator to select archive and trace options.

Data Access Subsystem

1. Connect desktop workstation to database server and validate user name and password for authority to access data.
2. View observation data:
 - Retrieve observation data sets based on date and (optional) inspector, contract item number, CCO number, or CPM activity code (in any combination).
 - Display observation data sets on-line in a screen version of Daily Diaries.
 - Print observation data sets in a paper version of Daily Diaries. Diaries shall include the following information:
 - First page header: Department logo, contract number & description, date, workday, jobsite and inspector shift hours, weather a.m./p.m., temperature hi/lo, humidity hi/lo, inspector name and signature, page number.
 - Subsequent page header: contract number & description, date, workday, inspector name, page number.
 - Report body: summary of items of work performed, list of laborers, list of equipment, list of pay items, list of general remarks.
 - Report footer: “end of report” indicator.
 - Print a special “CCO diary” to show only observations for a specified CCO.
 - Print a special “activity diary” to show only observations for a specified CPM activity.
 - Compute and display/print the California Department of Transportation (Caltrans) construction workday for each diary.
3. Edit observation data:
 - Retrieve observation data sets based on inspector and approval status.
 - Display observation data sets on-line in a screen version of Daily Diaries.
 - Allow observation data sets to be created, duplicated, and edited on-line, providing substantially the same functionality as provided by the mobile computer but adapted for desktop environment.
 - Allow observation data sets to be imported from plain text files.
 - Allow remark text to be imported from text files.
 - Print observation data sets in a paper version of Daily Diaries.
 - Print “CCO diary” to show only observations for a specified CCO.
 - Print “activity diary” to show only observations for a specified CPM activity.
 - Compute and display/print the Department construction workday for each diary.

4. Approve observation data:

- Retrieve observation data sets based on inspector, supervisor, and approval status.
- Display observation data sets on-line in a screen version of Daily Diaries.
- Allow observation data sets to be approved or rejected on-line.
- Print observation data sets in a paper version of Daily Diaries.
- Print “CCO diary” to show only observations for a specified CCO.
- Print “activity diary” to show only observations for a specified CPM activity.
- Compute and display/print the Department construction workday for each diary.

5. Report observation data.

- Display/print an inspector work summary report by date, supervisor, inspector, contract.
- Display/print a labor compliance report by date, Contractor, employee, contract.
- Display/print an item detail report for labor hours by date, Contractor, contract, item/CCO/activity.
- Display/print an item detail report for equipment hours by date, Contractor, equipment ID, contract, item/CCO/activity.
- Display/print an item detail report for pay items by date, Contractor, contract, item/CCO/activity.
- Display/print an item detail report for remarks by date, remark type, contract, item/CCO/activity.
- Display/print an extra work report for labor hours by date, Contractor, contract, CCO.
- Display/print an extra work report for equipment hours by date, Contractor, equipment ID, contract, CCO.
- Display/print an extra work report for pay items by date, Contractor, contract, CCO.
- Display/print a pay items summary report by date and contract.

6. Prepare source sheets for use in pay estimates.

- Allow source sheets to be selected by contract, item and month.
- Provide storage for estimate data on a per-item basis:
 - Original estimate quantity, changes due to CCO, and current estimate quantity.
 - Quantity previously paid, quantity paid this month, total paid to date.
- Provide a list of those items which have had activity for the current month.
- Automatically retrieve all pay item observations for the given item and the given month and calculate the total.
- Allow monthly total to be adjusted and reason for adjustment to be recorded.
- Print the resulting source sheets.

7. Allow maintenance of control table data in the Oracle database:

- Provide the ability to add, modify or delete entries in the database control tables:
 - Users (inspectors).
 - Weather conditions.
 - Labor classifications
 - Remark types.
 - Employee Titles.
 - Name/phone list.
 - Contractors.
 - Laborers.
 - Equipment.
 - Contracts.
 - Contract items.
 - CCOs.
 - CPM activity codes.
 - Inspector assignments to contracts.
 - Contractor assignments to contract items.
- Provide the ability to import lists of laborers & equipment from contractors into the database.
- Maintain integrity of database data and constraints during edit and import processes.

HARDWARE REQUIREMENTS.--The Contractor shall furnish all hardware required for the electronic mobile daily diary computer system, including PDAs, desktop systems, servers, printers, and miscellaneous hardware. The minimum requirements for the various classes of hardware are as follows:

- PDA: Apple Newton 2100 Message Pad or 100% compatible with 8MB RAM, 8MB ROM, 2MB external RAM card, charging station, carrying case, and Newton OS 2.0.
- Desktop: Complete computer system, including keyboard, mouse and monitor, using a 266 MHz Intel Pentium II processor or equivalent with minimum of sixty-four (64) megabytes of random access memory (RAM), three-gigabyte minimum hard disk drive, 1.44 megabyte 3 1/2 inch floppy disk drive, 16x speed minimum CD-ROM drive, 33.6 / 14.4 modem, 17-inch minimum monitor capable of at least 1,024 x 768 pixels, and Windows NT user (client) license.
- Printer: HP LaserJet 5-series or 100% compatible.
- Network: Ethernet network with twisted-pair wiring and passive hub.

The Contractor shall supply hardware for the system in the following quantities:

- 35 – PDA and accessories as described above.
- 04– desktop workstations as described above.
- 01– printers as described above.
- as need it – misc. network hardware and cables as described above.
- 10 – PDA keyboards.
- 04 – PDA print packs.
- 35– Oracle Workgroup Server licenses.
- 100 - WriteRight screen enhancers
- 70 - Replacement styluses for PDAs

SUPPORT REQUIREMENTS.--The Contractor shall furnish all support required for the electronic mobile daily diary computer system. The minimum requirements for support are as follows:

- Installation: initial on-site installation and verification of hardware, software and networks.
- Training: initial on-site training for one half day for up to (35) Department inspectors and database/system administrators.
- Telephone and e-mail support: the Department system administrator may submit operational questions by telephone during normal business hours or by electronic mail at any time. Emergencies will receive immediate attention, and other questions will be answered within one business day.
- Software updates: occasional maintenance updates to the application software, as available.
- On-site visits: scheduled visits to the installation site to check system operation, provide “refresher” or advanced training as applicable, install software updates, as agreed with the Engineer.

The Contractor shall furnish support required for the Electronic Mobile Daily Diary Computer System for a period of 24 months following award of contract.

PAYMENT.--Mobile Daily Diary Computer System will be paid at a lump sum price.

The contract lump sum price paid for electronic mobile daily diary computer system shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in supplying the mobile daily diary computer system, complete and in place, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Payment for providing and implementing this mobile daily diary computer system will be made on a lump sum basis, in 4 milestones as follows:

Milestone 1: This milestone will be satisfied upon delivery and installation of hardware and database software as described under "Hardware Requirements", above. Payment for milestone 1 will equal 45% of total item lump sum cost.

Milestone 2: This milestone will be satisfied upon acceptance of the system by the Engineer as functionally complete per these specifications. Payment for milestone 2 will equal 25% of total item lump sum cost.

Milestone 3: This milestone will be satisfied upon completion of initial training for Department personnel. Training shall be held at a time and location approved by the Engineer. Payment for milestone 3 will equal 15% of total item lump sum cost.

Milestone 4: This milestone will be satisfied upon completion of the third of three feedback sessions between the Electronic Mobile Daily Diary Computer System vendor and Department engineers. Payment for milestone 4 will equal 15% of total item lump sum cost.

5-1.23 ELECTRONIC MOBILE DAILY DIARY SYSTEM DATA DELIVERY

Attention is directed to Sections 5-1.10, "Equipment and Plants," and 7-1.01A(3), "Payroll Records," of the Standard Specifications, and these special provisions.

The Contractor shall submit to the Engineer a list of each piece of equipment and its identifying number, type, make, model and rate code in accordance with the Department of Transportation publication entitled "Labor Surcharge and Equipment Rental Rate" which is in effect on the date upon the work is performed, and the names, labor rates and work classifications for all field personnel employed by the Contractor and all subcontractors in connection with the public work, together with such additional information as is identified below. This information shall be updated and submitted to the Engineer weekly through the life of the project.

This personnel information will only be used for this mobile daily diary computer system and it will not relieve the Contractor and subcontractors from all the payroll records requirements as required by Section 7-1.01A(3), "Payroll Records," of the Standard Specifications.

The Contractor shall provide the personnel and equipment information not later than 11 days after the contract award for its own personnel and equipment, and not later than 5 days before start of work by any subcontractor for the labor and equipment data of that subcontractor.

The minimum data to be furnished shall comply with the following specifications:

Data Content Requirements.--

1. The Contractor shall provide the following basic information for itself and for each subcontractor that will be used on the contract:

Company name.	Alphanumeric; up to 30 characters.
Company type (prime or sub)	Alphanumeric; up to 10 characters.
Address (line 1).	Alphanumeric; up to 30 characters.
Address (line 2).	Alphanumeric; up to 30 characters.
Address (city).	Alphanumeric; up to 30 chars.
Address (2-letter state code).	Alphanumeric; up to 2 characters.
Address (zip code)	Alphanumeric; up to 14 characters.
Contact name.	Alphanumeric; up to 30 characters
Telephone number (with area code).	Alphanumeric; up to 20 characters.
Company code: short company name.	Alphanumeric; up to 10 characters.
Type of work (Department-supplied codes)	Alphanumeric; up to 30 characters
DBE status (Department-supplied codes)	Alphanumeric; up to 20 characters.
Ethnicity for DBE status (Department-supplied codes).	Alphanumeric; up to 20 characters.
List of laborers to be used on this contract (detail specified below).	
List of equipment to be used on this contract (detail specified below).	

For example, one such set of information for a company might be:

XYZ
1240 9TH STREET
SUITE 600
OAKLAND
CA
94612
JOHN SMITH
(510) 834-9999
XYZ
MBE
BLACK

2. The Contractor shall provide the following information for each laborer who will be used on the contract:

Company code (as defined above).	Alphanumeric; up to 10 characters.
Last name.	Alphanumeric; up to 20 characters.
First name.	Alphanumeric; up to 15 characters.
Middle initial.	Alphanumeric; up to 1 characters.
Labor classification (Department-provided codes).	Alphanumeric; up to 10 characters.
Hourly rate.	Alphanumeric; up to (6,2)
Trainee status (Y/N).	Alphanumeric; up to 1 characters
Ethnicity (Department-provided codes).	Alphanumeric; up to 20 characters.
Gender.	Alphanumeric; up to 1 characters.

For example, one such set of information might be:

XYZ
GONZALEZ
HECTOR
V
OPR
22.75
N
HISPANIC
M

3. The Contractor shall provide the following information for each piece of equipment that will be used on the contract:

Company code (as defined above).	Alphanumeric; up to 10 characters.
Company's equipment ID number.	Alphanumeric; up to 10 characters.
Company's equipment description.	Alphanumeric; up to 60 characters.
Equipment type (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment make (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment model (from Department ratebook).	Alphanumeric; up to 60 characters.
Equipment rate code (from Department ratebook).	Alphanumeric; up to 10 characters
Hourly rate.	Alphanumeric; up to (6,2)
Rental flag.	Alphanumeric; up to 1 character

For example, one such set of information might be:

XYZ
B043
CAT TRACTOR D-6C
TRACC
CAT
D-6C
3645
28.08
N

Data Delivery Requirements.--

1. All data described in "Data Requirements" of this section shall be delivered to the Department electronically, on 3 1/2" floppy disks compatible with the Microsoft Windows operating system. The Contractor shall provide a weekly disk and hard copy of the required correct updated personnel and equipment information for the Contractor and all the subcontractors and verified correct by the Engineer.
2. Data of each type of described in the previous section (Contractor, labor, and equipment information) will be delivered separately, each type in one or more files on floppy disk. Any given file may contain information from one contractor or from multiple contractors, but only one type of data (contractor, labor, or equipment information).

3. The file format for all files delivered to the Department shall be standard comma-delimited, plain text files. This type of file (often called "CSV") is the most standard type for interchange of formatted data; it can be created and read by all desktop spreadsheet and desktop database applications. Characteristics of this type of file are:

- All data is in the form of plain ASCII characters.
- Each row of data (company, person, equipment) is delimited by a carriage return character.
- Within rows, each column (field) of data is delimited by a comma character.

4. The files shall have the following columns (i.e., each row shall have the following fields):

- Contractor info: 11 columns (fields) as specified in "Data Requirements #1", above.
- Labor info: 9 columns (fields) as specified in "Data Requirements #2", above.
- Equipment info: 8 columns (fields) as specified in "Data Requirements #3", above.

For each type of file, columns (fields) must be in the order specified under "Data Requirements", above. All columns (fields) described under "Data Requirements" must be present for all rows, even if some column (field) values are empty. The first row of each file may contain column headers (in plain text) rather than data, if desired.

5. Column (field) contents must conform to the data type and length requirements described in the "Data Requirement" section, above. In addition, column (field) data must conform to the following restrictions:

- All data shall be uppercase.
- Company type shall be either "PRIME" or "SUB".
- Labor classification codes must conform to a list of standard codes that will be supplied by Department.
- Contractor type of work codes and DBE status codes must conform to a list of standard codes that will be supplied by Department.
- Ethnicity codes must conform to standard codes that will be supplied by Department.
- Data in the "trainee status" column must be either "Y" or "N".
- Data in the "gender" column must be either "M" or "F".
- Data in the "rental equipment" column must be either "Y" or "N".
- Equipment owner's description may not be omitted. (The description, together with the equipment number, is how the equipment will be identified in the field.)
- Equipment type, make, model, and ratebook code shall conform to the Department of Transportation Publication entitled "Labor Surcharge and Equipment Rental Rate", which is in effect on the date upon the work is performed. If the equipment in question does not have an entry in the book then alternate, descriptive entries may be made in these fields.

6. The name of each file must indicate its contents, e.g., "XYZlab.txt" for laborers from XYZ Company, Inc. Each floppy disk supplied to the Department must be accompanied by a printed list of the files it contains with a brief description of the contents of each file.

PAYMENT.-- Payment for providing electronic mobile daily diary computer system data delivery will be made on a lump sum basis. The lump sum bid price for electronic mobile daily diary computer system data delivery will be made according to the following schedule:

The Contractor will receive not more than 9.0 per cent per month of the total bid price for electronic mobile daily diary computer system data delivery.

After the completion of the work, 100 per cent payment will be made for electronic mobile daily diary computer system data delivery less the permanent deduction, if any, for failure to deliver complete weekly electronic mobile daily diary computer system data in each month.

The contract lump sum price paid for electronic mobile daily diary computer system data delivery shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in electronic mobile daily diary computer system data delivery as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

In the event the Contractor fails to deliver complete weekly electronic mobile daily diary computer system data in each month, the Department will retain 5 per cent of the total bid price for electronic mobile daily diary computer system data delivery until the data is delivered.

5-1.24 AREAS FOR CONTRACTOR'S USE

Area available for the use of the Contractor is designated on the plans. Temporary storage of equipment and materials on State property may be arranged with the Engineer, subject to the prior demands of State maintenance forces and to all other contract requirements. Use of the Contractor's work areas and other State-owned property shall be at the Contractor's own risk, and the State shall not be held liable for any damage to or loss of materials or equipment located within such areas.

The Contractor shall remove all equipment, materials, and rubbish from the work areas and other State-owned property which he occupies and shall leave the areas in a presentable condition, in conformance with the provisions in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

The Contractor shall secure at his own expense any area required for storage of plant, equipment and materials, or for other purposes if sufficient area is not available to him within the contract limits.

Attention is directed to "Cooperation," elsewhere in these special provisions, regarding the shared use of this area.

5-1.25 UTILITIES

The Contractor may use electrical power, water, and compressed air from existing State outlets within the contract limits, where such utilities exist, free of charge for contract operations provided that the Contractor does not misuse such services and provided that such utility services are in service and are not required by the State for other purposes, and subject to the provisions of "Cooperation" of these special provisions.

The Contractor shall make his own arrangements to obtain any additional electrical power, water, or compressed air or other utilities required for his operations and shall make and maintain the necessary service connections at his own expense.

5-1.26 SANITARY PROVISIONS

State sanitary facilities will not be available for use by the Contractor's employees.

5-1.27 BRIDGE TOLLS

Toll-free passage on the San Francisco-Oakland Bay Bridge will be granted only for cars, trucks and special construction equipment which are clearly marked on the exterior with the Contractor's identification and which are being operated by the Contractor exclusively for the project and for the purpose of transporting materials and workmen directly to and from the jobsite.

The Contractor shall make application to the Engineer in advance for toll-free passage. The Contractor will be held accountable for the proper use of all passes issued, and upon completion of the work, shall return all unused passes.

Attention is directed to Section 23302, "Evasion of Toll," of the Vehicle Code.

5-1.28 ACCESS TO JOBSITE

Prospective bidders may make arrangements to visit the jobsite by contacting the Maintenance Manager, San Francisco-Oakland Bay Bridge, at telephone (510) 286-3922.

5-1.29 DRAWINGS

Attention is directed to Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications and these special provisions.

When working drawings are required by these special provisions, the drawings shall be submitted in accordance with the provisions in Section 55-1.02, "Drawings," of the Standard Specifications and the following:

1. Working drawings shall be submitted to the Engineer.
2. Working drawings shall not exceed 22" x 34" in size.
3. Microfilms are required of all approved shop drawings and shall be only a 24x reduction.

Working drawings will be required for temporary deck bridging, temporary supports, tiedown anchors and falsework.

5-1.30 FORCE ACCOUNT PAYMENT

The second, third and fourth paragraphs of Section 9-1.03A, "Work Performed by Contractor," of the Standard Specifications, shall not apply.

To the total of the direct costs computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications, there will be added a markup of 25 percent to the cost of labor, 10 percent to the cost of materials, and 10 percent to the equipment rental.

The above markups, together with payments made for time related overhead pursuant to "Overhead" of these special provisions, shall constitute full compensation for all overhead costs for work paid for on a force account basis. These overhead costs shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," of the Standard Specifications. The total payment made as provided above and in the first paragraph of Section 9-1.03A, "Work Performed by Contractor," shall be deemed to be the actual cost of the work performed on a force account basis, and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in accordance with the provisions in Section 8-1.01, "Subcontracting," of the Standard Specifications, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this section "Force Account Payment." Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

5-1.31 OVERHEAD

The Contractor will be compensated for overhead in accordance with these special provisions.

Attention is directed to "Force Account Payment" and "Progress Schedule (Critical Path)" of these special provisions.

Section 9-1.08, "Adjustment of Overhead Costs," of the Standard Specifications shall not apply.

Time related overhead shall consist of those overhead costs, including field and home office overhead, that are in proportion to the time required to complete the work.

The quantity of time related overhead to be measured for payment will be the number of working days specified in "Beginning of Work, Time of Completion and Liquidated Damages" of these special provisions, adjusted only as a result of suspensions and adjustments of time which revise the current contract completion date, as determined from the current accepted schedule as specified in "Progress Schedule (Critical Path)" of these special provisions, and which are also any of the following:

1. Suspensions of work ordered in accordance with Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications, except:
 - a) suspensions ordered due to the failure on the part of the Contractor to carry out orders given, or to perform any provision of the contract; and
 - b) suspensions ordered due to unsuitable weather conditions;
2. Extensions of time granted by the State in accordance with the provisions of the fifth paragraph of Section 8-1.07, "Liquidated Damages," of the Standard Specifications; or
3. Reductions in contract time set forth in approved contract change orders, in accordance with Section 4-1.03, "Changes," of the Standard Specifications.

The contract price paid for time related overhead shall include full compensation for time related overhead measured for payment as specified above, incurred by the Contractor and by any joint venture partner, subcontractor, supplier or other party associated with the Contractor.

No adjustment in compensation will be made for any increase or decrease in the quantities of time related overhead required, regardless of the reason for the increase or decrease. The provisions in Sections 4-1.03B, "Increased or Decreased Quantities," and 4-1.03C, "Changes in Character of the Work," of the Standard Specifications, shall not apply to time related overhead.

For progress payment purposes, the number of working days to be paid for time related overhead in each month will be the number of working days specified above to be measured for payment that the Contractor performed work on the current controlling operation or operations as specified in Section 8-1.06, "Time of Completion," of the Standard Specifications. Working days specified above to be measured for payment, on which the Contractor did not perform work on the controlling operation or operations will be measured and included for payment in the first estimate after acceptance of the contract made in accordance with Section 9-1.07, "Payment After Acceptance," of the Standard Specifications.

Full compensation for overhead other than time related overhead measured and paid for as specified above, and other than overhead costs for extra work performed pursuant to Section 4-1.03D of the Standard Specifications, shall be considered as included in the various items of work and no additional compensation will be allowed therefor.

SECTION 6. (BLANK)

SECTION 7. (BLANK)

SECTION 8. MATERIALS

SECTION 8-1. MISCELLANEOUS

8-1.01 PREQUALIFIED AND TESTED SIGNING AND DELINEATION MATERIALS

The Department maintains a trade name list of approved prequalified and tested signing and delineation materials and products. Approval of prequalified and tested products and materials shall not preclude the Engineer from sampling and testing any of the signing and delineation materials or products at any time.

Said listing of approved prequalified and tested signing and delineation materials and products cover the following:

MATERIALS and PRODUCTS

Temporary pavement markers
Striping and pavement marking tape
Pavement markers, reflective and non-reflective
Flexible Class 1 delineators and channelizers
Railing and barrier delineators
Sign sheeting and base materials
Reflective sheeting for barricades
Reflective sheeting for channelizers
Reflective sheeting for markers and delineators
Reflective sheeting for traffic cone sleeves
Reflective sheeting for barrels and drums

None of the above listed signing and delineation materials and products shall be used in the work unless such material or product is listed on the Department's List of Approved Traffic Products. A Certificate of Compliance shall be furnished as specified in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for signing and delineation materials and products. Said certificate shall also certify that the signing and delineation material or product conforms to the prequalified testing and approval of the Department of Transportation, Division of Traffic Operations and was manufactured in accordance with the approved quality control program.

Materials and products will be considered for addition to said approved prequalified and tested list if the manufacturer of the material or product submits to the Division of Traffic Operations a sample of the material or product. The sample shall be sufficient to permit performance of all required tests. Approval of such materials or products will be dependent upon a determination as to compliance with the specifications and any test the Department may elect to perform.

The following is a listing of approved prequalified and tested signing and delineation materials and products:

PAVEMENT MARKERS, PERMANENT TYPE

REFLECTIVE

Adelite (4"x4")
Apex (4"x4")
Pavement Markers, Inc., "Hye-Lite" (4"x4")
Ray-O-Lite, Models SS, RS, and AA (4"x4")
Ray-O-Lite, Models 2002 (2.4"x4.7")
Stimsonite, Model 88 (4" x4")

REFLECTIVE WITH ABRASION RESISTANT SURFACE

Ray-O-Lite "AA" ARS (4" x4")(Not for use in recessed applications)
Ray-O-Lite Mod. 2002 ARS (2.2"x4.7")
Stimsonite, Model 911 (4"x4")(Not for use in recessed applications)
Stimsonite, Model 944 SB (2"x4")
Stimsonite, Model 948 (2.3"x4.7")

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Stimsonite, Model 953 (2.75"x4.5")(Not for use in recessed applications)

NON-REFLECTIVE FOR USE WITH EPOXY OR BITUMEN ADHESIVE

Apex Universal (Ceramic)
Highway Ceramics Inc. (Ceramic)
Zumar, TM40W/Y (Polyester)

NON-REFLECTIVE FOR USE WITH BITUMEN ADHESIVE ONLY

Apex Universal, Model 929 (ABS)
Elgin Molded Plastics, "Empco-Lite" Model 900 (ABS)
Hi-Way Safety Inc., Models P20-2000W and 2001Y (ABS)
Interstate Sales, "Diamond Back" (ABS)
Loomis Plastics, D-Dot (ABS)
Pavement Markers Inc., (Marker Supply) - Models A1107 and AY1108 (ABS)
Road Creations, Model RCB4NR (Acrylic)

PAVEMENT MARKERS, TEMPORARY TYPE

TEMPORARY MARKERS FOR LONG TERM DAY/NIGHT USE (6 Months or less)

Apex Universal, Model 924 (4"x4")
Elgin Molded Plastics, "Empco-Lite" Model 901 (4" Round)
Highway Technologies, Megalites (4"x4")
Road Creations, Model R41C (4"x4")

TEMPORARY MARKERS FOR SHORT TERM DAY/NIGHT USE (14 days or less)

Apex Universal, Model 932
Davidson Plastics, Models TOM (Standard) with Reflexite PC-1000, or (WZ) with Reflexite AC-1000 Sheeting
Hi-Way Safety Inc., Model 1280/1281 with Reflexite PC-1000
Stimsonite, Model 300 "Temporary Overlay Marker"

TEMPORARY MARKERS FOR SHORT TERM DAY/NIGHT USE (14 days or less at seal coat locations)

Apex Universal, Model 932
Davidson Plastics, Models TRPM (Standard) with Reflexite PC-1000, or (WZ) with Reflexite AC-1000 Sheeting
Davidson Plastics, Models "HH" (High Heat) TRPM (Standard) with Reflexite PC-1000, or (WZ) with Reflexite AC-1000 Sheeting
Hi-Way Safety Inc., Model 1280/1281 with Reflexite PC-1000
Stimsonite, Model 301 Chip Seal Marker

STRIPING AND PAVEMENT MARKING MATERIAL

PERMANENT TRAFFIC STRIPING AND PAVEMENT MARKING TAPE

(For use on high and low volume roadways)
Advanced Traffic Marking, Series 300 and 400
Brite-Line, Series 1000
Swarco Industries, "Director 60"
3M, "Stamark" Series 380, A420, A440 and 5730
(For use on low volume roadways only)
3M, "Stamark" Series A320 Bisymetric

TEMPORARY REMOVABLE STRIPING AND PAVEMENT MARKING TAPE

Advanced Traffic Marking, ATM Series 200

Contract No. 04-043474

Brite-Line, Series 100
P.B. Laminations, Aztec, Grade 102
Swarco Industries, "Director-2"
3M, "Stamark" Brand, Detour Grade, Series 5710 and A620

PREFORMED THERMOPLASTIC

Flint Trading, "Premark"
Pavemark, "Hotape"

REMOVABLE TRAFFIC PAINT

Belpro, Series 250/252 and No. 93 Remover

CLASS 1 DELINEATORS

ONE-PIECE DRIVEABLE FLEXIBLE TYPE, 1200 mm (48")

Carsonite, Curve-Flex CFRM-400
Carsonite, Roadmarker CRM-375
Davidson Plastics, "Flexi-Guide 400 and 566"
GreenLine Model HWDI-66
GreenLine Model CGDI-66

SPECIAL USE FLEXIBLE TYPE, 1200 mm (48")

Carsonite, "Survivor" with 18" U-Channel anchor
FlexStake, H-D
GreenLine HWD with 18" soil anchor
GreenLine CGD with 18" soil anchor
Safe-Hit with 8" pavement anchor (SH248-GPR and SHAI-08-PI)
Safe-Hit, with 15" soil anchor (SHA5-15C-GL)
Safe-Hit, with 18" soil anchor (SH248-GPR and SHAI-18C-PL)

SURFACE MOUNT FLEXIBLE TYPE, 1200 mm (48")

Bent Manufacturing Co., "Masterflex" Model MF-180EX-48"
Carsonite, "Super Duck II"
FlexStake, Surface Mount H-D

CHANNELIZERS

SURFACE MOUNT TYPE 900 mm (36")

Bent Manufacturing Co., "Masterflex" Models MF-360-36 (Round) and MF-180-36" (Flat)
Carsonite, "Super Duck" (Flat SDF-436, Round SDR-336)
Carsonite, Super Duck II "The Channelizer"
FlexStake, Surface Mount H-D
GreenLine SMD-36
Repo, Models 300 and 400
Safe-Hit, Guide Post, Model SH236SMA, with glue down base
The Line Connection, "Dura-Post" Model DP36-3C

TYPE "K" OBJECT MARKERS 450 mm (18")

Carsonite, Model SMD-615
Repo, Models 300 and 400
Safe-Hit, Model SH718SMA
The Line Connection, Model DP21-4K (Vertical configuration only)

TYPE "Q" OBJECT MARKERS, 450-600 mm (18-24")

Carsonite, Super Duck II
Repo, Models 300 and 400
Safe-Hit, Models SH824SMA--WA and SH824GP3--WA
The Line Connection, Model "DP21-4Q"

CONCRETE BARRIER MARKERS (For use to the left of traffic.)

IMPACTABLE TYPE

Astro Optics "FB"
Davidson Plastics, Model PCBM-12
Duraflex Corp., "Flexx 2020" and "Electriflexx"

NON-IMPACTABLE TYPE

Astro-Optics, JD Series
Stimsonite, Model 967 (with 3 1/4" Acrylic cube corner reflector)
Stimsonite, Model 967LS
Vega Molded Products, Models GBM and JD

THREE BEAM BARRIER MARKERS (For use to the left of traffic.)

Duraflex Corp., "Railrider"
Davidson Plastics, "Mini" (3"x10")

CONCRETE BARRIER DELINEATORS 400 mm (16"). (For use to the right of traffic. When mounted on top of barrier, places top of reflective element at 48" [1200 mm])

Davidson Plastics, Model PCBM T-16
Safe-Hit, Model SH216RBM

SOUND WALL DELINEATOR (On vertical surface, places top of reflective element at 48" [1200 mm].)

Davidson Plastics, PCBM S-36

GUARD RAILING DELINEATOR 685 mm (27") Wood Post Type. (For use to the right or left of traffic. Places reflective element at 48" [1200 mm].)

Carsonite, Model 427
Davidson Plastics FG 427 and FG-527
GreenLine GRD 27-inch
Safe-Hit, Model SH227GRD

GUARD RAILING DELINEATOR 685 mm (27") Steel Post Type. (For use to the right or left of traffic. Places reflective element at 48" [1200 mm].)

Carsonite, Model CFGR-327 with CFGRBK300 Mounting Bracket

REFLECTIVE SHEETING FOR:

CHANNELIZERS, BARRIER MARKERS AND DELINEATORS

3M, High Intensity (Long Term)
Reflexite, PC-1000, Metalized Polycarbonate (Long Term)
Reflexite, AC-1000, Acrylic (Long Term)
Reflexite, AP-1000, Metalized Polyester (Short Term)
Stimsonite, Series 4500 (For Carsonite CurveFlex and Roadmarker delineators only)

TRAFFIC CONES

330 mm (13") Sleeves
Reflexite SB (Polyester), Vinyl or "TR" (Semi-transparent)

100 and 150 mm (4" and 6") Sleeves
3M Series 3840
Reflexite Vinyl

BARRELS AND DRUMS

Reflexite, "Super High Intensity"
3M Series 3810

BARRICADES

Type I, Engineer Grade
American Decal, Adcolite
Avery Dennison, 1500/1600
Nikkalite, 8100 Series
3M, Scotchlite, Series CW

SIGNS

Type II, Super Engineer Grade (State-Furnished Signs Only)
Avery Dennison, "Fasign" 2500 Series
Kiwalite, Type II
Nikkalite 1800 Series

Type III, High Performance
3M, High Intensity, Series 3870

Type IV, High Performance
Stimsonite, Series 4200

Type VI, Roll-Up Signs
Reflexite, Vinyl

Note: Sheeting Types conforming to the requirements of ASTM Designation: D 4956-93B

SIGN SUBSTRATE FOR CONSTRUCTION AREA SIGNS

Aluminum
Fiberglass Reinforced Plastic (FRP)
Sequentia, "Polyplate"
Fiber-Brite

8-1.02 STATE-FURNISHED MATERIALS

Attention is directed to Section 6-1.02, "State-Furnished Materials," of the Standard Specifications and these special provisions.

The following materials will be furnished to the Contractor:

Padlocks.
Marker panels for Type R object markers.
Incandescent lamps for flashing beacons.

SECTION 8-2. CONCRETE

8-2.01 PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to the provisions in Section 90, "Portland Cement Concrete," of the Standard Specifications and these special provisions.

Wherever the word "cement" is used in the Standard Specifications or the special provisions, and its use conforms to one of the following criteria, it shall be understood to mean "cementitious material":

- A. When the cement content of portland cement concrete is specified and Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.
- B. When the pounds of cement per cubic yard for portland cement concrete is specified and Section 90, "Portland Cement Concrete," of the Standard Specifications is referenced.

The above criteria shall not apply when the use of mineral admixture is not allowed.
Section 90-1.01, "Description," of the Standard Specifications is amended to read:

90-1.01 Description.—Portland cement concrete shall be composed of cementitious material, fine aggregate, coarse aggregate, admixtures if used, and water, proportioned and mixed as specified in these specifications.

Unless otherwise specified, cementitious material to be used in portland cement concrete shall conform to the requirements for cement and mineral admixtures in Section 90-2, "Materials" and shall be either: 1) "Type IP (MS) Modified" cement; or 2) a combination of "Type II Modified" portland cement and mineral admixture.

For precast, steam cured, or other high early strength concrete, mineral admixture will not be required if it has been determined by the Transportation Laboratory and documented in writing by the Engineer that the aggregate is from a source that is not alkali silica reactive.

Concrete for each portion of the work shall comply with the requirements for the Class, cementitious material content in pounds per cubic yard, 28-day compressive strength, minor concrete, or commercial quality concrete, as shown on the plans or specified in these specifications or the special provisions.

Class A concrete shall contain not less than 564 pounds of cementitious material per cubic yard.

Class B concrete shall contain not less than 470 pounds of cementitious material per cubic yard.

Class C concrete shall contain not less than 376 pounds of cementitious material per cubic yard.

Class D concrete shall contain not less than 658 pounds of cementitious material per cubic yard.

Minor concrete shall contain not less than 564 pounds of cementitious material per cubic yard unless otherwise specified in these specifications or the special provisions.

Unless otherwise designated on the plans or specified in these specifications or the special provisions, the amount of cementitious material used per cubic yard of concrete in structures or portions of structures shall conform to the following:

Use	Cementitious Material Content in pounds
Concrete which is designated by compressive strength:	
Deck slabs and slab spans of bridges	658 min., 800 max.
Roof sections of exposed top box culverts	658 min., 800 max.
Other portions of structures	564 min., 800 max.
Concrete not designated by compressive strength:	
Deck slabs and slab spans of bridges	658 min.
Roof sections of exposed top box culverts	658 min.
Prestressed members	658 min.
Seal courses	658 min.
Other portions of structures	564 min.

Whenever the 28-day compressive strength shown on the plans is 3,500 pounds per square inch or greater, the concrete shall be considered to be designated by compressive strength. If the plans show a 28-day compressive strength which is 4,500 pounds per square inch or greater, an additional 7 days will be allowed to obtain the specified strength. The 28-day compressive strengths shown on the plans which are less than 3,500 pounds per square inch, are shown for design information only and are not to be considered a requirement for acceptance of the concrete.

Concrete designated by compressive strength shall be proportioned such that the concrete will conform to the strength shown on the plans or specified in the special provisions.

The Contractor shall determine the mix proportions for all concrete except pavement concrete. The Engineer will determine the mix proportions for pavement concrete.

Before using concrete for which the mix proportions have been determined by the Contractor, or in advance of revising those mix proportions, the Contractor shall submit in writing to the Engineer a copy of the mix design.

Compliance with cementitious material content requirements will be verified in accordance with procedures described in California Test 518 for cement content. For testing purposes, mineral admixture shall be considered to be cement. Batch proportions shall be adjusted as necessary to produce concrete having the specified cementitious material content.

If any concrete used in the work has a cementitious material content, consisting of cement, mineral admixture, or cement plus mineral admixture, which is less than the minimum required for the work, the concrete shall be removed. However, if the Engineer determines that the concrete is structurally adequate, the concrete may remain in place and the Contractor shall pay to the State \$0.25 for each pound of cement, mineral admixture, or cement plus mineral admixture which is less than the minimum required for the work. The Department may deduct the amount from any monies due, or that may become due, the Contractor under the contract. The deductions will not be made unless the difference between the contents required and those actually provided exceeds the batching tolerances permitted by Section 90-5, "Proportioning." No deductions for cementitious material content will be made based on the results of California Test 518.

The requirements of the preceding paragraph shall not apply to minor concrete nor commercial quality concrete.

All concrete for which the mix proportions are determined either by the Contractor or the Engineer shall conform to the requirements of this Section 90.

The first paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

90-2.01 Portland Cement.—Unless otherwise specified, portland cement shall be either "Type IP (MS) Modified" cement or "Type II Modified" portland cement.

"Type IP (MS) Modified" cement shall conform to the specifications for Type IP (MS) cement in ASTM Designation: C 595, and shall be comprised of an intimate mixture of Type II cement and not more than 25 percent of a mineral admixture. The type and minimum amount of mineral admixture used in the manufacture of "Type IP (MS) Modified" cement shall be in accordance with the provisions of Section 90-4.08, "Required Use of Mineral Admixtures."

"Type II Modified" portland cement shall conform to the specifications for Type II portland cement in ASTM Designation: C 150.

In addition, "Type IP (MS) Modified" cement and "Type II Modified" portland cement shall conform to the following requirements:

- A. The cement shall not contain more than 0.60 percent by weight of alkalies, calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O , when determined by either direct intensity flame photometry or by the atomic absorption method. The instrument and procedure used shall be qualified as to precision and accuracy in accordance with the requirements of ASTM Designation: C 114.
- B. The autoclave expansion shall not exceed 0.50 percent.
- C. Mortar, containing the cement to be used and Ottawa sand, when tested in accordance with California Test 527, shall not expand in water more than 0.010 percent and shall not contract in air more than 0.048 percent except that when cement is to be used for precast prestressed concrete piling, precast prestressed concrete members or steam cured concrete products, the mortar shall not contract in air more than 0.053 percent.

The second paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is amended to read:

Type III and Type V portland cements shall conform to the specifications in ASTM Designation: C 150, and the modifications listed above for Type II Modified portland cement, except that when tested in accordance with California Test 527, mortar containing Type III portland cement shall not contract in air more than 0.075 percent.

The third paragraph in Section 90-2.01, "Portland Cement," of the Standard Specifications is deleted.

The twelfth paragraph in Section 90-2.02, "Aggregates," of the Standard Specifications is deleted.

The first paragraph in Section 90-2.03, "Water," of the Standard Specifications is amended to read:

90-2.03 Water.—In conventionally reinforced concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4 . In prestressed concrete work, the water for curing, for washing aggregates, and for mixing shall be free from oil and shall not contain more than 650 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO_4 . In no case shall the water contain an amount of impurities that will cause either: 1) a change in the setting time of cement of more than 25 percent when tested in accordance with ASTM Designation: C 191 or ASTM Designation: C 266; or 2) a reduction in the compressive strength of mortar at 14 days of more than 5 percent, when tested in accordance with ASTM Designation: C 109, when compared to the results obtained with distilled water, tested in accordance with ASTM Designation: C 109.

The following section is added to Section 90-2, "Materials," of the Standard Specifications:

90-2.04 Admixture Materials.—Admixture materials shall conform to the requirements of the ASTM Designations shown below:

Chemical Admixtures—ASTM Designation: C 494.

Air-entraining Admixtures—ASTM Designation: C 260.

Calcium Chloride—ASTM Designation: D 98.

Mineral Admixtures—Coal fly ash, raw or calcined natural pozzolan as specified in ASTM Designation: C 618, except that the loss on ignition shall not exceed 4 percent, or, silica fume as specified in ASTM Designation: C 1240, with reduction of mortar expansion of 80 percent, minimum, using the cement from the proposed mix design.

Mineral admixtures shall be used in accordance with the provisions in Section 90-4.08, "Required Use of Mineral Admixtures."

Section 90-4.02, "Materials," of the Standard Specifications is amended to read:

90-4.02 Materials.—Admixture materials shall be as specified in Section 90-2.04, "Admixture Materials."

Section 90-4.05, "Optional Use of Chemical Admixtures," of the Standard Specifications is amended to read:

90-4.05 Optional Use of Chemical Admixtures.—The Contractor will be permitted to use Type A or F, water-reducing; Type B, retarding; or Type D or G, water-reducing and retarding admixtures as described in ASTM Designation: C 494 to conserve cementitious material or to facilitate any concrete construction application subject to the following conditions:

When a water-reducing admixture or a water-reducing and retarding admixture is used, the cementitious material content specified or ordered may be reduced by a maximum of 5 percent by weight except that the resultant cementitious material content shall be not less than 470 pounds per cubic yard.

When a reduction in cementitious material content is made, the dosage of admixture used shall be the dosage used in determining approval of the admixture.

Section 90-4.07, "Optional Use of Air-entraining Admixtures," of the Standard Specifications is amended to read:

90-4.07 Optional Use of Air-entraining Admixtures.—When air-entrainment has not been specified or ordered by the Engineer, the Contractor will be permitted to use an air-entraining admixture to facilitate the use of any construction procedure or equipment provided that the average air content, as determined by California Test 504, of 3 successive tests does not exceed 4 percent and no single test value exceeds 5.5 percent. If the Contractor elects to use an air-entraining admixture in concrete for pavement, the Contractor shall so indicate at the time the Contractor designates the source of aggregate as provided in Section 40-1.015, "Cement Content."

Section 90-4.08, "Required Use of Mineral Admixtures," of the Standard is amended to read:

90-4.08 Required Use of Mineral Admixtures.—Unless otherwise specified, mineral admixture shall be combined with cement to make cementitious material for use in portland cement concrete.

The calcium oxide content of mineral admixtures shall not exceed 10 percent and the alkali content as Na₂O shall not exceed 4 percent as determined by California Test 404.

The amounts of cement and mineral admixture used in cementitious material for portland cement concrete shall be sufficient to satisfy the minimum cementitious material content requirements specified in Section 90-1.01, "Description," or Section 90-4.05, "Optional Use of Chemical Admixtures," and shall conform to the following:

The minimum amount of cement shall not be less than 75 percent by weight of the specified minimum cementitious material content.

The minimum amount of mineral admixture to be combined with cement shall be determined using one of the following criteria:

- A. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is equal to or less than 2 percent by weight, the amount of mineral admixture shall not be less than 15 percent by weight of the total amount of cementitious material to be used in the mix.
- B. When the calcium oxide content of a mineral admixture, measured in conformance with the requirements of ASTM Designation: C 618 and Section 90-2.04, "Admixture Materials," is greater than 2 percent, the amount of mineral admixture shall not be less than 25 percent by weight of the total amount of cementitious material to be used in the mix.
- C. When a mineral admixture is used, which conforms to the requirements for silica fume in Section 90-2.04, "Admixture Materials," is used, the amount of mineral admixture shall not be less than 10 percent by weight of the total amount of cementitious material to be used in the mix.

If more than the required amount of cementitious material is used, the balance of the additional cementitious material in the mix may be either cement, mineral admixture or a combination of both; however, the maximum amount of mineral admixture shall not exceed 35 percent by weight of the total amount of cementitious material to be used in the mix. Where Section 90-1.01, "Description," specifies a maximum cementitious content in pounds per cubic yard, the total weight of cement and mineral admixture per cubic yard shall not exceed the specified maximum cementitious material content.

Section 90-4.09, "Optional Use of Mineral Admixture," of the Standard Specifications is deleted.

Section 90-4.11, "Storage, Proportioning, and Dispensing of Mineral Admixtures," of the Standard Specifications is amended to read:

90-4.11 Storage, Proportioning, and Dispensing of Mineral Admixtures.—Mineral admixtures shall be protected from exposure to moisture until used. Sacked material shall be piled to permit access for tally, inspection and identification for each shipment.

Adequate facilities shall be provided to assure that mineral admixtures meeting the specified requirements are kept separate from other mineral admixtures in order to prevent any but the specified mineral admixtures from entering the work. Safe and suitable facilities for sampling mineral admixtures shall be provided at the weigh hopper or in the feed line immediately in advance of the hopper.

Mineral admixtures shall be incorporated into concrete using equipment conforming to the requirements for cement weigh hoppers, and charging and discharging mechanisms in ASTM Designation: C 94, in Section 90-5.03, "Proportioning," and in this Section 90-4.11.

When interlocks are required for cement and mineral admixture charging mechanisms by Section 90-5.03A, "Proportioning for Pavement," and cement and mineral admixtures are weighed cumulatively, their charging mechanisms shall be interlocked to prevent the introduction of mineral admixture until the weight of cement in the cement weigh hopper is within the tolerances specified in Section 90-5.02, "Proportioning Devices."

Mineral admixture used in concrete for exposed surfaces of like elements of a structure shall be from the same source and of the same percentage.

Section 90-5.02, "Proportioning Devices," of the Standard Specifications is amended to read:

90-5.02 Proportioning Devices.—All weighing, measuring or metering devices used for proportioning materials shall conform to the requirements in Section 9-1.01, "Measurement of Quantities," and this Section 90-5.02. In addition, any automatic weighing systems used shall comply with the requirements for automatic proportioning devices in Section 90-5.03A, "Proportioning for Pavement." These automatic devices shall be automatic to the extent that the only manual operation required for proportioning the aggregates, cement, and mineral admixture for one batch of concrete is a single operation of a switch or starter.

Proportioning devices shall be tested at the expense of the Contractor as frequently as the Engineer may deem necessary to insure their accuracy.

Weighing equipment shall be insulated against vibration or movement of other operating equipment in the plant. When the plant is in operation, the weight of each batch of material shall not vary from the weight designated by the Engineer by more than the tolerances specified herein.

Equipment for cumulative weighing of aggregate shall have a zero tolerance of ± 0.5 percent of the designated total batch weight of the aggregate. For systems with individual weigh hoppers for the various sizes of aggregate, the zero tolerance shall be ± 0.5 percent of the individual batch weight designated for each size of aggregate. Equipment for cumulative weighing of cement and mineral admixtures shall have a zero tolerance of ± 0.5 percent of the designated total batch weight of the cement and mineral admixture. Equipment for weighing cement or mineral admixture separately shall have a zero tolerance of ± 0.5 percent of their designated individual batch weights. Equipment for measuring water shall have a zero tolerance of ± 0.5 percent of its designated weight or volume.

The weight indicated for any batch of material shall not vary from the preselected scale setting by more than the following:

- A. Aggregate weighed cumulatively shall be within 1.0 percent of the designated total batch weight of the aggregate. Aggregates weighed individually shall be within 1.5 percent of their respective designated batch weights.
- B. Cement shall be within 1.0 percent of its designated batch weight. When weighed individually, mineral admixture shall be within 1.0 percent of its designated batch weight. When mineral admixture and cement are permitted to be weighed cumulatively, cement shall be weighed first to within 1.0 percent of its designated batch weight, and the total for cement and mineral admixture shall be within 1.0 percent of the sum of their designated batch weights.
- C. Water shall be within 1.5 percent of its designated weight or volume.

Each scale graduation shall be approximately 0.001 of the total capacity of the scale. The capacity of scales for weighing cement, mineral admixture, or cement plus mineral admixture and aggregates shall not exceed that of commercially available scales having single graduations indicating a weight not exceeding the maximum permissible weight variation above, except that no scale shall be required having a capacity of less than 1,000 pounds, with one-pound graduations.

Section 90-5.03, "Proportioning," of the Standard Specifications is amended to read:

90-5.03 Proportioning.—Proportioning shall consist of dividing the aggregates into the specified sizes, each stored in a separate bin, and combining them with cement, mineral admixture and water as provided in these specifications. Aggregates shall be proportioned by weight.

At the time of batching, all aggregates shall have been dried or drained sufficiently to result in a stable moisture content such that no visible separation of water from aggregate will take place during transportation from the proportioning plant to the point of mixing. In no event shall the free moisture content of the fine aggregate at the time of batching exceed 8 percent of its saturated, surface-dry weight.

Should separate supplies of aggregate material of the same size group, but of different moisture content or specific gravity or surface characteristics affecting workability, be available at the proportioning plant, withdrawals shall be made from one supply exclusively and the materials therein completely exhausted before starting upon another.

Bulk "Type IP (MS) Modified" cement, that conforms to the requirements in Section 90-2.01, "Portland Cement," shall be weighed in an individual hopper and shall be kept separate from the aggregates until the ingredients are released for discharge. Except as otherwise noted below, the cement hoppers may be attached to a separate scale for individual weighing. If the cement is weighed cumulatively, the cement shall be weighed before the other ingredients.

Bulk cement to be blended with mineral admixture for use in portland cement concrete for pavement and structures shall be proportioned by one of the following methods:

1. Bulk cement and mineral admixture shall be weighed in individual weigh-hoppers and shall be kept separate from each other and from the aggregates until the ingredients are released for discharge into the mixer. The weigh systems for the proportioning of the aggregate, the cement, and the mineral admixture shall be individual and distinct from all other weigh systems. Each weigh system shall be equipped with a hopper, a lever system, and a weight indicator to constitute an individual and independent material weighing device. The aggregate, the cement, and the mineral admixture shall be discharged into the mixer simultaneously.
2. Bulk cement and mineral admixture may be weighed in the same weigh hopper if the mix uniformity conform to the requirements of Annex "A1, Concrete Uniformity Requirements," of ASTM Designation: C 94 as tested by the Contractor. The capability of the mixing methods and devices shall be established before starting production of portland cement concrete for contract work. Mix uniformity sampling and testing shall be done in the presence of the Engineer. The Engineer shall approve the mixing methods and devices as a supplement to California Test 109. The time between tests for mix uniformity testing shall be the same as that required by California Test 109 for portland cement concrete batch plant scale calibration.

The scale and weigh hopper for bulk weighing cement, mineral admixture, and cement plus mineral admixture shall be separate and distinct from the aggregate weighing equipment.

When the source of any aggregate is changed for concrete structures, the Contractor shall adjust the mix proportions and submit in writing to the Engineer a copy of the mix design before using such aggregates. When the source of any aggregate is changed for other concrete, the Engineer shall be allowed sufficient time to adjust the mix and such aggregates shall not be used until necessary adjustments are made.

For all batches with a volume of one cubic yard or more, the batching equipment shall conform to one of the following combinations:

- A. Separate boxes and separate dial or beam scale and indicator for weighing each size of aggregate.
- B. Single box and dial or multiple beam type scale indicator for all aggregates.
- C. Single box or separate boxes and automatic weighing mechanism for all aggregates.

In order to check the accuracy of batch weights, the gross weight and tare weight of batch trucks, truck mixers, truck agitators, and non-agitating hauling equipment shall be determined when ordered by the Engineer. The equipment shall be weighed at the Contractor's expense on scales designated by the Engineer.

Section 90-5.03A, "Proportioning for Pavement," of the Standard Specifications is amended to read:

90-5.03A Proportioning for Pavement.—Aggregates and bulk cement, mineral admixture, and cement plus mineral admixture for use in pavement shall be proportioned by weight by means of automatic proportioning devices of approved type conforming to the requirements specified in this Section 90-5.03A.

The Contractor shall install and maintain in operating condition an electrically actuated moisture meter that will indicate, on a readily visible scale, changes in the moisture content of the fine aggregate as it is batched within a sensitivity of 0.5 percent by weight of the fine aggregate.

The batching of cement, mineral admixture, or cement plus mineral admixture and aggregate shall be interlocked so that a new batch cannot be started until all weigh hoppers are empty, the proportioning devices are within zero

tolerance, and the discharge gates are closed. The interlock shall permit no part of the batch to be discharged until all aggregate hoppers and the cement and mineral admixture hoppers or the cement plus mineral admixture hopper are charged with weights which are within the tolerances specified in Section 90-5.02, "Proportioning Devices."

The discharge gate on the cement and mineral admixture hoppers or the cement plus mineral admixture hopper shall be designed to permit regulating the flow of cement, mineral admixture, or cement plus mineral admixture into the aggregate as directed by the Engineer.

When separate weigh boxes are used for each size of aggregate, the discharge gates shall permit regulating the flow of each size of aggregate as directed by the Engineer.

Material discharged from the several bins shall be controlled by gates or by mechanical conveyors. The means of withdrawal from the several bins, and of discharge from the weigh box, shall be interlocked so that not more than one bin can discharge at a time, and that the weigh box cannot be tripped until the required quantity from each of the several bins has been deposited therein. Should a separate weigh box be used for each size of aggregate, all may be operated and discharged simultaneously.

When the discharge from the several bins is controlled by gates, each gate shall be actuated automatically so that the required weight is discharged into the weigh box, after which the gate shall automatically close and lock.

The automatic weighing system shall be designed so that all proportions required may be set on the weighing controller at the same time.

The third paragraph in Section 90-6.01, "General," of the Standard Specifications is amended to read:

All concrete shall be homogeneous and thoroughly mixed, and there shall be no lumps or evidence of undispersed cement, mineral admixture, or cement plus mineral admixture.

The third and fourth paragraphs in Section 90-6.02, "Machine Mixing," of the Standard Specifications are amended to read:

The batch shall be so charged into the mixer that some water will enter in advance of cementitious materials and aggregates. All water shall be in the drum by the end of the first one-fourth of the specified mixing time.

Cementitious materials shall be batched and charged into the mixer by means that will not result either in loss of cementitious materials due to the effect of wind, or in accumulation of cementitious materials on surfaces of conveyors or hoppers, or in other conditions which reduce or vary the required quantity of cementitious material in the concrete mixture.

The sixth paragraph in Section 90-6.02, "Machine Mixing," of the Standard Specifications is amended to read:

The total elapsed time between the intermingling of damp aggregates and all cementitious materials and the start of mixing shall not exceed 30 minutes.

The seventh and eighth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

When a truck mixer or agitator is used for transporting concrete to the delivery point, discharge shall be completed within 1.5 hours, or before 250 revolutions of the drum or blades, whichever comes first, after the introduction of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85° F., or above, a time less than 1.5 hours may be required.

When non-agitating hauling equipment is used for transporting concrete to the delivery point, discharge shall be completed within one hour after the addition of the cement to the aggregates. Under conditions contributing to quick stiffening of the concrete, or when the temperature of the concrete is 85° F., or above, the time between the introduction of cement to the aggregates and discharge shall not exceed 45 minutes.

The ninth and tenth paragraphs in Section 90-6.03, "Transporting Mixed Concrete," of the Standard Specifications are amended to read:

Each load of concrete delivered at the jobsite shall be accompanied by a ticket showing the mix identification number, non-repeating load number, date and time at which the materials were batched, the total amount of water (gallons) added to the load and for transit-mixed concrete, the reading of the revolution counter at the time the truck mixer is charged with cement. This ticket shall also show the actual scale weights (pounds) for the ingredients batched or the calculated portland cement concrete volume (cubic yards) calculated from actual scale weights. Theoretical or target batch weights shall not be used as a substitute for actual scale weights. When showing a calculated portland cement concrete volume on the delivery ticket, the Contractor shall maintain and have available a record of the following information for each batched load:

1. Mix identification number, specific to the contract.
2. Load number shall match the load number on the delivery ticket.
3. Date and time the load was batched.
4. Actual batch weight (pounds) for each ingredient.
5. Any water (gallons) added at the plant, in addition to the water proportioned for the batch.

When requested, the Contractor shall submit the recorded information for calculated portland cement concrete volumes to the Engineer. The information shall be provided in printed form, or if acceptable to the Engineer, data may be submitted in electronic media. Electronic media shall be presented in a tab delimited format on a 3.5-inch diskette with a capacity of at least 1.4 megabytes. Captured data, for the ingredients represented by each batch shall be LFCR (one line, separate record) with allowances for sufficient fields to satisfy the amount of data required by these specifications.

Section 90-6.05, "Hand-Mixing," of the Standard Specifications is amended to read:

90-6.05 Hand-Mixing.—Hand-mixed concrete shall be made in batches not more than one-third cubic yard and shall be mixed on a watertight, level platform. The proper amount of coarse aggregate shall be measured in measuring boxes and spread on the platform and the fine aggregate shall be spread on this layer, the 2 layers being not more than one foot in total depth. On this mixture shall be spread the dry cement and mineral admixture and the whole mass turned no fewer than 2 times dry; then sufficient clean water shall be added, evenly distributed, and the whole mass again turned no fewer than 3 times, not including placing in the carriers or forms.

The second paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

The amount of free water used in concrete shall not exceed 312 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cementitious material in excess of 564 pounds per cubic yard.

The fourth paragraph in Section 90-6.06, "Amount of Water and Penetration," of the Standard Specifications is amended to read:

Where there are adverse or difficult conditions which affect the placing of concrete, the above specified penetration and free water content limitations may be exceeded providing the Contractor is granted permission by the Engineer in writing to increase the cementitious material content per cubic yard of concrete. The increase in water and cementitious material shall be at a ratio not to exceed 30 pounds of water per added 100 pounds of cementitious material per cubic yard. The cost of additional cementitious material and water added under these conditions shall be at the Contractor's expense and no additional compensation will be allowed therefor.

Section 90-9.01, "General," of the Standard Specifications is amended to read:

90-9.01 General.—Concrete compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The compressive strength of concrete will be determined from test cylinders which have been fabricated from concrete sampled in accordance with California Test 539. Test cylinders will be molded and initial field cured in accordance with California Test 540. Test cylinders will be cured and tested after receipt at the testing laboratory in accordance with California Test 521. A strength test shall consist of the average strength of 2 cylinders fabricated from material taken from a single load of concrete, except that, if any cylinder should show evidence of improper sampling, molding, or testing, that cylinder shall be discarded and the strength test shall consist of the strength of the remaining cylinder.

When concrete compressive strength is specified as a prerequisite to applying loads or stresses to a concrete structure or member, test cylinders for other than steam cured concrete will be cured in accordance with Method 1 of California Test 540. The compressive strength of concrete determined for these purposes will be evaluated on the basis of individual tests.

When concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete strength to be used as a basis for acceptance of other than steam cured concrete will be determined from cylinders cured in conformance with Method 1 of California Test 540. If the result of a single compressive strength test at the maximum age specified or allowed is below the specified strength but is 95 percent or more of the

specified strength, the Contractor shall, at the Contractor's expense, make corrective changes, subject to approval of the Engineer, in the mix proportions or in the concrete fabrication procedures, before placing additional concrete, and shall pay to the State \$10.00 for each in-place cubic yard of concrete represented by the deficient test. If the result of a single compressive strength test at the maximum age specified or allowed is below 95 percent of the specified strength, but is 85 percent or more of the specified strength, the Contractor shall make the corrective changes specified above, and shall pay to the State \$15.00 for each in place cubic yard of concrete represented by the deficient test. In addition, such corrective changes shall be made when the compressive strength of concrete tested at 7 days indicates, in the judgment of the Engineer, that the concrete will not attain the required compressive strength at the maximum age specified or allowed. All concrete represented by a single test which indicates a compressive strength of less than 85 percent of the specified 28-day compressive strength will be rejected in accordance with the provisions in Section 6-1.04, "Defective Materials."

If the test result indicates that the compressive strength at the maximum curing age specified or allowed is below the specified strength, but 85 percent or more of the specified strength, payments to the State as required above shall be made, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength of the concrete placed in the work meets or exceeds the specified 28-day compressive strength. If the test result indicates a compressive strength at the maximum curing age specified or allowed below 85 percent, the concrete represented by that test will be rejected, unless the Contractor, at the Contractor's expense, obtains and submits evidence acceptable to the Engineer that the strength and quality of the concrete placed in the work are acceptable. If the evidence consists of tests made on cores taken from the work, the cores shall be obtained and tested in accordance with the specifications of ASTM Designation: C 42.

No single compressive strength test shall represent more than 300 cubic yards.

When a precast concrete member is steam cured, the compressive strength of the concrete will be determined from test cylinders which have been handled and stored in accordance with Method 3 of California Test 540. The compressive strength of steam cured concrete will be evaluated on the basis of individual tests representing specific portions of production. When the concrete is designated by 28-day compressive strength rather than by cementitious material content, the concrete shall be considered to be acceptable whenever its compressive strength reaches the specified 28-day compressive strength provided that strength is reached in not more than the maximum number of days specified or allowed after the member is cast.

When concrete is specified by compressive strength, prequalification of materials, mix proportions, mixing equipment, and procedures proposed for use, will be required prior to placement of the concrete. Prequalification shall be accomplished by the submission of acceptable certified test data or trial batch reports by the Contractor. Prequalification data shall be based on the use of materials, mix proportions, mixing equipment, procedures, and size of batch proposed for use in the work.

Certified test data, in order to be acceptable, must indicate that not less than 90 percent of at least 20 consecutive tests exceed the specified strength at the maximum number of cure days specified or allowed, and none of those tests are less than 95 percent of specified strength. Strength tests included in the data shall be the most recent tests made on concrete of the proposed mix design and all shall have been made within one year of the proposed use of the concrete.

Trial batch test reports, in order to be acceptable, must indicate that the average compressive strength of 5 consecutive concrete cylinders, taken from a single batch, at not more than 28 days (or the maximum age allowed) after molding shall be at least 600 pounds per square inch greater than the specified 28-day day compressive strength, and no individual cylinder shall have a strength less than the specified strength at the maximum age specified or allowed. Data contained in the report shall be from trial batches which were produced within one year of the proposed use of specified strength concrete in the project. Whenever air-entrainment is required, the air content of trial batches shall be equal to or greater than the air content specified for the concrete without reduction due to tolerances.

All tests shall be performed in accordance with either the appropriate California Test methods or the comparable ASTM test methods. All equipment employed in testing shall be in good condition and shall be properly calibrated. If the tests are performed during the life of the contract, the Engineer shall be notified sufficiently in advance of performing the tests in order to witness the test procedures.

The certified test data and trial batch test reports shall include the following information:

- A. Date of mixing.
- B. Mixing equipment and procedures used.
- C. The size of batch in cubic yards and the weight, type and source of all ingredients used.
- D. Penetration of the concrete.
- E. The air content of the concrete if an air-entraining admixture is used.
- F. The age at time of testing and strength of all concrete cylinders tested.

All certified test data and trial batch test reports shall be signed by an official of the firm which performed the tests.

When approved by the Engineer, concrete from trial batches may be used in the work at locations where concrete of a lower quality is required and the concrete will be paid for as the type or class of concrete required at that location.

After materials, mix proportions, mixing equipment, and procedures for concrete have been prequalified for use, additional prequalification by testing of trial batches will be required prior to making any changes which, in the judgment of the Engineer, could result in a lowering of the strength of the concrete below that specified.

The Contractor's attention is directed to the time required to test trial batches and the Contractor shall be responsible for production of trial batches at a sufficiently early date so that the progress of the work is not delayed.

When precast concrete members are manufactured at the plant of an established manufacturer of precast concrete members, the mix proportions of the concrete shall be determined by the Contractor, and a trial batch and prequalification of the materials, mix proportions, mixing equipment, and procedures will not be required.

Section 90-10.02A, "Portland Cement," of the Standard Specifications is renamed "Cementitious Material" and amended to read:

90-10.02A Cementitious Material.—Cementitious material shall conform to the provisions in Section 90-1.01, "Description." Compressive strength requirements consist of a minimum strength which must be attained before various loads or stresses are applied to the concrete and, for concrete designated by strength, a minimum strength at the age of 28 days or at the age otherwise allowed in Section 90-1.01, "Description." The various strengths required are specified elsewhere or are shown on the plans.

The fifth paragraph in Section 90-10.02B, "Aggregate," of the Standard Specifications is deleted.
Section 90-10.03, "Production," of the Standard Specifications is amended to read:

Cementitious material, water, aggregate, and admixtures shall be stored, proportioned, mixed, transported, and discharged in conformance with recognized standards of good practice, which will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and which conforms to requirements specified herein. "Recognized standards of good practice" are outlined in various industry publications such as are issued by American Concrete Institute, AASHTO, or California Department of Transportation.

The cementitious material content of minor concrete shall conform to the provisions in Section 90-1.01, "Description."

The amount of water used shall result in a consistency of concrete conforming to the provisions in Section 90-6.06, "Amount of Water and Penetration." Additional mixing water shall not be incorporated into the concrete during hauling or after arrival at the delivery point, unless authorized by the Engineer.

Discharge of ready-mixed concrete from the transporting vehicle shall be made while the concrete is still plastic and before any stiffening occurs. An elapsed time of 1.5 hours (one hour in non-agitating hauling equipment), or more than 250 revolutions of the drum or blades, after the introduction of the cementitious material to the aggregates, or a temperature of concrete of more than 90° F. will be considered as conditions contributing to the quick stiffening of concrete. The Contractor shall take whatever action is necessary to eliminate quick stiffening, except that the addition of water will not be permitted.

The required mixing time in stationary mixers shall be not less than 50 seconds nor more than 5 minutes.

The minimum required revolutions at mixing speed for transit-mixed concrete shall be not less than that recommended by the mixer manufacturer, and shall be increased, if necessary, to produce thoroughly and uniformly mixed concrete.

Each load of ready-mixed concrete shall be accompanied by a ticket which shall be delivered to the Engineer at the discharge location of the concrete, unless otherwise directed by the Engineer. The ticket shall be clearly marked with the date and time of day when the load left the batching plant and, if hauled in truck mixers or agitators, the time the mixing cycle started.

A Certificate of Compliance in accordance with the provisions in Section 6-1.07, "Certificates of Compliance," shall be furnished to the Engineer, prior to placing minor concrete from a source not previously used on the contract, stating that minor concrete to be furnished meets all contract requirements, including minimum cementitious material content specified.

The third and fourth paragraphs in Section 90-11.02, "Payment," of the Standard Specifications are amended to read:

Should the Engineer order the Contractor to incorporate any admixtures in the concrete when their use is not required by these specifications or the special provisions, furnishing the admixtures and adding them to the concrete will be paid for as extra work as provided in Section 4-1.03D.

Should the Contractor use admixtures as permitted under Sections 90-4.05, "Optional Use of Chemical Admixtures;" or 90-4.07, "Optional Use of Air-entraining Admixtures;" or should the Contractor request and obtain permission to use other admixtures for the Contractor's benefit, the Contractor shall furnish those admixtures and incorporate them in the concrete at the Contractor's expense and no additional compensation will be allowed therefor.

8-2.02 ROADWAY DECK SLAB REQUIREMENTS

The amount of free water used in concrete for roadway deck slabs of highway bridges and structure approach slabs shall not exceed 325 pounds per cubic yard, plus 20 pounds for each required 100 pounds of cement in excess of 658 pounds per cubic yard.

SECTION 8-3. WELDING

8-3.01 WELDING ELECTRODES

Flux core welding electrodes conforming to the requirements of AWS A5.20 E6XT-4 or E7XT-4 shall not be used to perform any type of welding for this project.

8-3.02 WELDING QUALITY CONTROL

Welding quality control shall apply to the items of work described herein and shall conform to the requirements in the AWS welding codes, the Standard Specifications and these special provisions.

Wherever reference is made to the following AWS welding codes in the Standard Specifications, on the plans or in these special provisions, the year of adoption for these codes shall be as listed:

AWS Code	Year of Adoption
D1.1	1996
D1.4	1992
D1.5	1995
D1.5 (metric only)	1996

All requirements of the AWS welding codes shall apply unless specified otherwise in the Standard Specifications, on the plans or in these special provisions. Wherever the abbreviation AWS is used, it shall be equivalent to the abbreviations ANSI/AWS or ANSI/AASHTO/AWS.

Except for steel piling, welding performed anywhere other than at a permanent fabrication facility that is certified under the AISC Quality Certification Program, Category III, Major Steel Bridges, shall conform to the provisions for welding quality control as specified herein. Welding of steel piling shall conform to the provisions in "Piling" elsewhere in these special provisions and to the provisions for welding quality control specified herein.

The welding of all fracture critical members (FCMs) shall conform to the provisions specified in the Fracture Control Plan (FCP) and herein.

Unless otherwise specified, when any type of welding is performed on items of work including 1) steel piles, 2) bar reinforcement, 3) steel structures, 4) column casings and 5) miscellaneous metal, the Contractor shall designate in writing a welding Quality Control Manager (QCM). The QCM shall be responsible directly to the Contractor for the quality of all welding, including materials and workmanship, performed by the Contractor and all subcontractors.

The QCM shall not be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project. The QCM may be an employee of the Contractor.

No welding inspection personnel or nondestructive testing (NDT) firms to be used in the work shall be employed or compensated by any subcontractor, or by other persons or entities hired by subcontractors, who will provide other services or materials for the project.

The QCM shall be the sole individual responsible to the Contractor for submitting and receiving all correspondence and required submittals and reports regarding welding to and from the Engineer.

Prior to submitting the Quality Control Plan (QCP) required herein, a pre-welding meeting shall be held between the Engineer, Contractor and any welding subcontractors to be used in the work to discuss the requirements for the QCP.

Prior to performing any welding, the Contractor shall submit to the Engineer, in accordance with the provisions of Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications, 3 copies of a separate QCP for each item of work for which welding is to be performed. As a minimum, each QCP shall include the following:

1. The name of the welding firm and the NDT firm to be used;

2. A manual prepared by the NDT firm that shall include equipment, testing procedures, code of safe practices, the Written Practice of the NDT firm, and the names, qualifications and documentation of certifications for all personnel to be used;
3. The name of the QCM and the names, qualifications and documentation of certifications for all Quality Control (QC) Inspectors and Assistant Quality Control Inspectors to be used;
4. An organizational chart showing all QC personnel and their assigned QC responsibilities;
5. The methods and frequencies for performing all required quality control procedures, including QC inspection forms to be used, as required by the specifications including:
 - (a) all visual inspections;
 - (b) all NDT including radiographic geometry, penetrameter and shim selection, film quality, film processing, radiograph identification and marking system, and film interpretation and reports; and
 - (c) calibration procedures and calibration frequency for all NDT equipment;
6. A system for the identification and tracking of all welds, NDT and any required repairs, and a procedure for the reinspection of any repaired welds. The system shall have provisions for 1) permanently identifying each weld and the person who performed the weld and 2) placing all identification and tracking information on each radiograph;
7. Standard procedures for performing noncritical repair welds. Noncritical repair welds are defined as welds to deposit additional weld beads or layers to compensate for insufficient weld size and to fill limited excavations that were performed to remove unacceptable edge or surface discontinuities, rollover or undercut. The depth of these excavations shall not exceed 65 percent of the specified weld size;
8. The welding procedure specification (WPS), including documentation of all supporting Procedure Qualification Record (PQR) tests performed, and the name of the testing laboratory who performed the tests, to verify the acceptability of the WPS. The submitted WPS shall be within the allowable period of effectiveness;
9. Documentation of all certifications for welders for each weld process and position that will be used. Certifications shall list the electrodes used, test position, base metal and thickness, tests performed, and the witnessing authority. All certifications shall be within the allowable period of effectiveness; and
10. One copy each of all AWS welding codes and the FCP which are applicable to the welding to be performed. These codes and the FCP shall become the permanent property of the Department.

The Engineer shall have 10 working days to review the QCP submittal after a complete plan has been received. No welding shall be performed until the QCP is approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the QCP, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

An amended QCP or addendum shall be submitted to, and approved in writing by the Engineer, for any proposed revisions to the approved QCP. An amended QCP or addendum will be required for any revisions to the QCP, including but not limited to a revised WPS, additional welders, changes in NDT firms or procedures, QC or NDT personnel, or updated systems for tracking and identifying welds. The Engineer shall have 3 working days to complete the review of the amended QCP or addendum. Work that is affected by any of the proposed revisions shall not be performed until the amended QCP or addendum has been approved. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the amended QCP or addendum, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

After final approval of the QCP, amended QCP or addendum, the Contractor shall submit to the Engineer 7 copies each of these approved documents.

A daily production log for welding shall be kept by the QCM for each day that welding is performed. The log shall clearly indicate the locations of all welding, and shall include the welders' names, amount of welding performed, any problems or deficiencies discovered, and any testing or repair work performed, at each location. The daily report from each Quality Control Inspector shall also be included in the log.

It is expressly understood that the Engineer's approval of the Contractor's QCP shall not relieve the Contractor of any responsibility under the contract for the successful completion of the work in conformity with the requirements of the plans and specifications. The Engineer's approval shall not constitute a waiver of any of the requirements of the plans and specifications nor relieve the Contractor of any obligation thereunder, and defective work, materials and equipment may be rejected notwithstanding approval of the QCP.

The following items shall be included in a Welding Report that is to be submitted to the Engineer within 7 days following the performance of any welding:

1. Reports of all visual weld inspections and NDT;

2. Radiographs and radiographic reports, and other required NDT reports;
3. Documentation that the Contractor has evaluated all radiographs and other nondestructive tests, corrected all rejectable deficiencies, and all repaired welds have been reexamined by the required NDT and found acceptable; and
4. Daily production log.

All reports regarding NDT, including radiographs, shall be signed by both NDT technician and the person that performed the review, and then submitted directly to the QCM for review and signature prior to submittal to the Engineer. Corresponding names shall be clearly printed or typewritten next to all signatures.

The Engineer shall review the Welding Report to determine if the Contractor is in conformance with the QCP. Except for steel piling, the Engineer shall be allowed 7 days to review the report and respond in writing after a complete Welding Report has been received. The review time for steel piling shall be as specified in "Piling" elsewhere in these special provisions. Prior to receiving notification from the Engineer of the Contractor's conformance with the QCP, the Contractor may encase in concrete or cover any welds for which a Welding Report has been submitted. However, should the Contractor elect to encase or cover those welds prior to receiving notification from the Engineer, it is expressly understood that the Contractor shall not be relieved of the responsibility for incorporating material in the work that conforms to the requirements of the plans and specifications. Any material not conforming to these requirements will be subject to rejection. Should the Contractor elect to wait to encase or cover any welds pending notification by the Engineer, and should the Engineer fail to complete the review and provide notification within this time allowance, and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in notification, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

Sections 6.1.1 through 6.1.3.3 of AWS D 1.1, Sections 7.1.1 and 7.1.2 of AWS D 1.4, and Sections 6.1.1.1 through 6.1.3.3 of AWS D 1.5 are replaced with the following:

Quality Control (QC) shall be the responsibility of the Contractor. As a minimum, the Contractor shall perform inspection and testing prior to welding, during welding and after welding as specified in this section and additionally as necessary to ensure that materials and workmanship conform to the requirements of the contract documents.

The Quality Control (QC) Inspector shall be the duly designated person who performs inspection, testing, and quality matters for all welding.

Quality Assurance (QA) is the prerogative of the Engineer. The QA Inspector is the duly designated person who acts for and on behalf of the Engineer.

All QC Inspectors shall be responsible for quality control acceptance or rejection of materials and workmanship, and shall be currently certified as AWS Certified Welding Inspectors (CWI) in accordance with the provisions of AWS QC1, "Standard and Guide for Qualification of Welding Inspectors."

The QC Inspector may be assisted by an Assistant QC Inspector provided that this individual is currently certified as an AWS Certified Associate Welding Inspector (CAWI) in accordance with the provisions of AWS QC1, "Standard and Guide for Qualification of Welding Inspectors," or has equivalent qualifications. The QC Inspector shall monitor the Assistant QC Inspector's work, and shall be responsible for signing all reports.

When the term "Inspector" is used without further qualification, it shall refer to the QC Inspector.

Section 6.14.7, "Personnel Qualification," of AWS D 1.1, Section 7.7.6, "Personnel Qualification," of AWS D 1.4 and Section 6.1.3.4, "Personnel Qualification," of AWS D 1.5 are amended to read:

Personnel performing NDT shall be qualified in accordance with the current edition of the American Society for Nondestructive Testing (ASNT) Recommended Practice No. SNT-TC-1A and the Written Practice of the NDT firm. Only individuals who are 1) qualified for NDT Level II, or 2) Level III technicians who have been directly certified by the ASNT and are authorized to perform the work of Level II technicians, shall perform NDT, review the results, and prepare the written reports.

Section 6.5.4, "Scope of Examination," of AWS D 1.1 and Section 7.5.4 of AWS D 1.4 are amended to read:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met.

Section 6.5.4 of AWS D 1.5 is amended to read:

The QC Inspector shall inspect and approve the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder to make certain that the applicable requirements of this code and the approved WPS are met. The QC Inspector shall examine the work to make certain that it meets the requirements of section 3 and 9.21. The size and contour of welds shall be measured using suitable gages. Visual inspection for cracks in welds and base metal, and for other discontinuities should be aided by strong light magnifiers, or such other devices as may be helpful. Acceptance criteria different from those specified in this code may be used when approved by the Engineer.

The Engineer shall have the authority to verify the qualifications or certifications of any welder, Quality Control Inspector, or NDT personnel to specified levels by retests or other means.

A sufficient number of QC Inspectors shall be provided to ensure continuous inspection when any welding is being performed. Continuous inspection, as a minimum, shall include (1) having QC Inspectors continually present on all shifts when any welding is being performed, or (2) having a QC Inspector within such close proximity of all welding operations that inspections by the QC Inspector of each operation, at each welding location, shall not lapse for a period exceeding 30 minutes.

Inspection and approval of the joint preparation, assembly practice, welding techniques, and performance of each welder, welding operator, and tack welder shall be documented by the QC Inspector on a daily basis for each day that welding is performed.

The QC Inspector shall provide reports to the QCM on a daily basis for each day that welding is performed.

Except for noncritical weld repairs, base metal repairs, or any other type of repairs not submitted in the QCP, the Engineer shall be notified immediately in writing when any welding problems or deficiencies are discovered and also of the proposed repair procedures to correct them. The Engineer shall have 5 working days to review these procedures. No remedial work shall begin until the repair procedures are approved in writing by the Engineer. Should the Engineer fail to complete the review within this time allowance and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in reviewing the proposed repair procedures, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

When joint details that are not prequalified by the applicable AWS codes are proposed for use in the work, all welders using these details shall perform a qualification test plate using the approved WPS variables and the joint detail to be used in production. The test plate shall be the maximum thickness to be used in production. The test plate shall be mechanically or radiographically tested as directed by the Engineer. Mechanical and radiographic testing and acceptance criteria shall be as specified in the applicable AWS codes.

The period of effectiveness for a welder's or welding operator's qualification shall be a maximum of 3 years for the same weld process, welding position, and weld type. A valid qualification at the beginning of work on a contract will be acceptable for the entire period of the contract, as long as the welder's work remains satisfactory.

All qualification tests for welders, welding operators, and WPSs used in welding operations will be witnessed by the Engineer or an independent third party acceptable to the Engineer.

Section 6.6.5, "Nonspecified Nondestructive Testing Other Than Visual," of AWS D 1.1, Section 6.6.5 of AWS D 1.4 and Section 6.6.5 of AWS D 1.5 shall not apply.

For any welding, the Engineer may direct the Contractor to perform NDT that is in addition to the visual inspection or NDT specified in the AWS welding codes, in the Standard Specifications or in these special provisions. Additional NDT required by the Engineer, will be paid for as extra work in accordance with Section 4-1.03D, "Extra Work," of the Standard Specifications. Should any welding deficiencies be discovered by this additional NDT, the cost of the testing will not be paid for as extra work, and shall be at the Contractor's expense.

All required repair work to correct welding deficiencies, whether discovered by the required visual inspection or NDT, or by additional NDT directed by the Engineer, and any associated delays or expenses caused to the Contractor by performing these repairs, shall be at the Contractor's expense.

At the completion of all welding, the QCM shall sign and furnish to the Engineer, a certificate of compliance in accordance with Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for each item of work for which welding was performed. The certificate shall state that all of the materials and workmanship incorporated in the work, and all required tests and inspections of this work, have been performed in accordance with the details shown on the plans and the provisions of the Standard Specifications and these special provisions.

Full compensation for conforming to all of the requirements of this section, Welding Quality Control, shall be considered as included in the contract prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

SECTION 9. DESCRIPTION OF BRIDGE WORK

The bridge work to be done consists, in general, of earthquake retrofitting a portion of the following structure as shown on the plans:

SAN FRANCISCO-OAKLAND BAY BRIDGE
(Bridge No. 34-0004)

SECTION 10. CONSTRUCTION DETAILS

SECTION 10-1. GENERAL

10-1.01 ORDER OF WORK

Order of work shall conform to the provisions in Section 5-1.05, "Order of Work," of the Standard Specifications and these special provisions.

Temporary crash cushion modules and temporary railing (Type K) shall be in place at locations shown on the plans prior to starting any adjacent construction activities.

Attention is directed to "Maintaining Traffic," "Temporary Railing," and "Temporary Crash Cushion Module" of these special provisions and to the stage construction sheets of the plans.

The work shall be performed in conformance with the stages of construction shown on the plans. Nonconflicting work in subsequent stages may proceed concurrently with work in preceding stages, provided satisfactory progress is maintained in said preceding stages of construction.

In each stage, after completion of the preceding stage, the first order of work shall be the removal of existing pavement delineation as directed by the Engineer. Pavement delineation removal shall be coordinated with new delineation so that lane lines are provided at all times on traveled ways open to public traffic.

Before obliterating any pavement delineation that is to be replaced on the same alignment and location, as determined by the Engineer, such pavement delineation shall be referenced by the Contractor, with a sufficient number of control points to reestablish the alignment and location of the new pavement delineation. The references shall also include the limits or changes in striping pattern, including one- and two-way barrier lines, limit lines, crosswalks and other pavement markings. Full compensation for referencing pavement delineation shall be considered as included in the contract prices paid for new pavement delineation and no additional compensation will be allowed therefor.

The jacking loads at Bent YA-5 Right shall not be applied until construction at Bent 1 Right is complete.

Adjacent bents shall not be supported by temporary supports simultaneously.

10-1.02 WATER POLLUTION CONTROL

Water pollution control work shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications and these special provisions.

This project shall conform to the requirements of Permit No. CAS029998 issued by the San Francisco Bay Regional (Region 2) Water Quality Control Board. This permit, hereafter referred to as the "Permit," regulates storm water discharges associated with construction activities.

Water pollution control work shall conform to the requirements in the Construction Contractor's Guide and Specifications of the Caltrans Storm Water Quality Handbooks, dated April 1997, and addenda thereto issued up to and including the date of advertisement of the project, hereafter referred to as the "Handbook". Copies of the Handbook may be obtained from the Department of Transportation, Material Operations Branch, Publication Distribution Unit, 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone: (916) 445-3520.

Copies of the Handbook and the Permit are also available for review at 111 Grand Avenue, Oakland, California 94612. Please call the Toll Bridge Seismic Program Duty Senior, telephone number (510) 286-5549, to reserve a copy of the documents at least 24 hours in advance.

The Contractor shall become fully informed of and comply with the applicable provisions of the Handbook, Permit and Federal, State and local regulations that govern the Contractor's operations and storm water discharges from both the project site and areas of disturbance outside the project limits during construction. The Contractor shall maintain a copy of the Permit at the project site and shall make the Permit available during construction activities.

Unless arrangements for disturbance of areas outside the project limits are made by the Department and made part of the contract, it is expressly agreed that the Department assumes no responsibility to the Contractor or property owner whatsoever with respect to any arrangements made between the Contractor and property owner to allow disturbance of areas outside the project limits.

The Contractor shall be responsible for the costs and for any liability imposed by law as a result of the Contractor's failure to comply with the requirements set forth in this section "Water Pollution Control", including but not limited to, compliance with the applicable provisions of the Handbook, Permit and Federal, State and local regulations. For the purposes of this paragraph, costs and liabilities include, but are not limited to, fines, penalties and damages whether assessed against the State or the Contractor, including those levied under the Federal Clean Water Act and the State Porter Cologne Water Quality Act.

In addition to any remedy authorized by law, so much of the money due the Contractor under the contract that shall be considered necessary by the Department may be retained by the State of California until disposition has been made of the costs and liabilities.

The retention of money due the Contractor shall be subject to the following:

1. The Department will give the Contractor 30 days notice of its intention to retain funds from any partial payment which may become due to the Contractor prior to acceptance of the contract. Retention of funds from any payment made after acceptance of the contract may be made without prior notice to the Contractor.
2. No retention of additional amounts out of partial payments will be made if the amount to be retained does not exceed the amount being withheld from partial payments pursuant to Section 9-1.06, "Partial Payments," of the Standard Specifications.
3. If the Department has retained funds and it is subsequently determined that the State is not subject to the costs and liabilities in connection with the matter for which the retention was made, the Department shall be liable for interest on the amount retained at the legal rate of interest for the period of the retention.

Conformance with the requirements of this section "Water Pollution Control" shall not relieve the Contractor from the Contractor's responsibilities, as provided in Section 7-1.11, "Preservation of Property," and Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

The Contractor shall, at reasonable times, allow authorized agents of the California Regional Water Quality Control Board, State Water Resources Control Board, U. S. Environmental Protection Agency and local storm water management agency, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the construction site and the Contractor's facilities pertinent to the work;
2. Have access to and copy any records that must be kept as specified in the Permit;
3. Inspect the construction site and related soil stabilization practices and sediment control measures; and
4. Sample or monitor for the purpose of ensuring compliance with the Permit.

The Contractor shall notify the Engineer immediately upon request from regulatory agencies to enter, inspect, sample, monitor or otherwise access the project site or the Contractor's records.

STORM WATER POLLUTION PREVENTION PLAN PREPARATION, APPROVAL AND UPDATES.—

As part of the water pollution control work, a Storm Water Pollution Prevention Plan, hereafter referred to as the "SWPPP," is required for this contract. The SWPPP shall conform to the requirements in Section 7-1.01G, "Water Pollution," of the Standard Specifications, the requirements in the Handbook, the requirements of the Permit and these special provisions. Upon the Engineer's approval of the SWPPP, the SWPPP shall be deemed to fulfill the requirements of Section 7-1.01G, "Water Pollution," of the Standard Specifications for development and submittal of a Water Pollution Control Program.

No work having potential to cause water pollution, as determined by the Engineer, shall be performed until the SWPPP has been approved by the Engineer.

Within 20 days after the approval of the contract, the Contractor shall submit 3 copies of the SWPPP to the Engineer. The Contractor shall allow 15 days for the Engineer to review the SWPPP. If revisions are required, as determined by the Engineer, the Contractor shall revise and resubmit the SWPPP within 10 days of receipt of the Engineer's comments and shall allow 10 days for the Engineer to review the revisions. Upon the Engineer's approval of the SWPPP, 3 additional copies of the SWPPP, incorporating the required changes, shall be submitted to the Engineer.

The objectives of the SWPPP shall be to identify pollution sources that may adversely affect the quality of storm water discharges associated with the project and to identify, construct, implement and maintain water pollution control measures, hereafter referred to as control measures, to reduce to the extent feasible pollutants in storm water discharges from the construction site both during and after construction is completed under this contract.

The SWPPP shall incorporate control measures in the following categories:

1. Soil stabilization practices;
2. Sediment control practices;
3. Sediment tracking control practices;
4. Wind erosion control practices;
5. Non-storm water management; and
6. Waste management and disposal control practices.

Specific objectives and minimum requirements for each category of control measures are contained in the Handbook.

The Contractor shall consider the objectives and minimum requirements presented in the Handbook for each of the above categories. The special minimum requirements listed below supersede the minimum requirements listed in the Handbook for the same category. When minimum requirements are listed for any category, the Contractor shall incorporate into the SWPPP, and implement on the project, one or more of the listed minimum controls required in order to meet the pollution control objectives for the category. In addition, the Contractor shall consider other control measures presented in the Handbook and shall incorporate into the SWPPP and implement on the project the control measures necessary to meet the objectives of the SWPPP. The Contractor shall document the selection process in accordance with the procedure specified in the Handbook. The following special minimum requirements are established:

Category:	Minimum Requirements:
Non-Storm Water and Waste Management Controls	CD10(2) Material Delivery and Storage, CD11(2) Material Use, CD12(2) Spill Prevention and Control, CD13(2) Solid Waste Management, CD16(2) Concrete Waste Management, CD18(2) Vehicle and Equipment Cleaning, CD19(2) Vehicle and Equipment Fueling, CD20(2) Vehicle and Equipment Maintenance, CD22(2) Scheduling, CD44(2) Illicit Discharge/Illegal Dumping Reporting
Erosion & Sediment Source Controls	CD25(2) Mulching CD26B(2) Geotextiles, Mats/Plastic Covers & Erosion Control Blankets
Wind Erosion Controls	CD26B(2) Geotextiles, Mats/Plastic Covers & Erosion Control Blankets
Sediment Treatment Controls	CD40(2) Storm Drain Inlet Protection CD43(2) Fiber Rolls

The SWPPP shall include, but not be limited to, the following items as described in the Handbook and Permit:

1. Source Identification;
2. Erosion and Sediment Controls;
3. Non-Storm Water Management;
4. Waste Management and Disposal;
5. Maintenance, Inspection and Repair;
6. Training;
7. List of Contractors and Subcontractors;
8. Post-Construction Storm Water Management;
9. Preparer;
10. Copy of the Local Permit;
11. BMP Consideration Checklist;
12. SWPPP Checklist;
13. Schedule of Values; and
14. Water Pollution Control Drawings.

The Contractor shall amend the SWPPP, graphically and in narrative form, whenever there is a change in construction activities or operations which may affect the discharge of significant quantities of pollutants to surface waters, ground waters, municipal storm drain systems, or when deemed necessary by the Engineer. The SWPPP shall also be amended if it is in violation of any condition of the Permit, or has not effectively achieved the objective of reducing pollutants in storm water discharges. Amendments shall show additional control measures or revised operations, including those in areas not shown in the initially approved SWPPP, which are required on the project to control water pollution effectively. Amendments to the SWPPP shall be submitted for review and approval by the Engineer in the same manner specified for the initially approved SWPPP. Approved amendments shall be dated and logged in the SWPPP. Upon approval of the amendment, the Contractor shall implement the additional control measures or revised operations.

The Contractor shall keep a copy of the SWPPP and approved amendments at the project site. The SWPPP shall be made available upon request of a representative of the Regional Water Quality Control Board, State Water Resources Control Board, U.S. Environmental Protection Agency or local storm water management agency. Requests by the public shall be directed to the Engineer.

By June 15 of each year, the Contractor shall submit an annual certification to the Engineer stating compliance with the requirements governing the Permit. If the project is in non-compliance at any time, the Contractor shall make a written report to the Engineer within 48 hours of identification of non-compliance.

SCHEDULE OF VALUES.—The Contractor shall submit with the SWPPP, for approval by the Engineer, a schedule of values detailing the cost breakdown of the contract lump sum item for water pollution control. The schedule of values shall reflect the items of work, quantities and costs for control measures shown in the SWPPP, except for critical temporary controls and permanent control measures which are shown on the project plans and for which there is a contract item of work. Adjustments in the items of work and quantities listed in the schedule of values shall be made when required to address approved amendments to the SWPPP.

The sum of the amounts for the units of work listed in the schedule of values shall be equal to the contract lump sum price for water pollution control.

If approved in writing by the Engineer, the schedule of values will be used to determine progress payments for water pollution control during the progress of the work, and as the basis for calculating any adjustment in compensation for the contract item for water pollution control due to changes in the work ordered by the Engineer.

SWPPP IMPLEMENTATION.—Upon approval of the SWPPP, the Contractor shall be responsible throughout the duration of the project for installing, constructing, inspecting and maintaining the control measures included in the SWPPP and any amendments thereto and for removing and disposing of temporary control measures. Unless otherwise directed by the Engineer or specified in these special provisions, the Contractor's responsibility for SWPPP implementation shall continue throughout any temporary suspension of work ordered in accordance with Section 8-1.05, "Temporary Suspension of Work," of the Standard Specifications. Requirements for installation, construction, inspection, maintenance, removal and disposal of control measures are specified in the Handbook and these special provisions.

Soil stabilization practices and sediment control measures, including minimum requirements, shall be provided throughout the winter season, defined as between September 15 and May 1.

Implementation of soil stabilization practices and sediment control measures for soil-disturbed areas of the project site shall be completed, except as provided for below, no later than 20 days prior to the beginning of the winter season or upon start of applicable construction activities for projects which begin either during or within 20 days of the winter season.

Throughout the winter season, the active, soil-disturbed area of the project site shall be no more than 2.5 acres. The Engineer may approve, on a case-by-case basis, expansions of the active, soil-disturbed area limit. The Contractor shall demonstrate the ability and preparedness to fully deploy soil stabilization practices and sediment control measures to protect soil-disturbed areas of the project site before the onset of precipitation. The Contractor shall maintain a quantity of soil stabilization and sediment control materials on site equal to 125 percent of that sufficient to protect unprotected, soil-disturbed areas on the project site and shall maintain a detailed plan for the mobilization of sufficient labor and equipment to fully deploy control measures required to protect unprotected, soil-disturbed areas on the project site prior to the onset of precipitation. The Contractor shall include a current inventory of control measure materials and the detailed mobilization plan as part of the SWPPP.

Throughout the winter season, soil-disturbed areas of the project site shall be considered to be nonactive whenever soil disturbing activities are expected to be discontinued for a period of 5 or more days and the areas are fully protected. Areas that will become nonactive either during the winter season or within 20 days thereof shall be fully protected with soil stabilization practices and sediment control measures within 10 days of the discontinuance of soil disturbing activities or prior to the onset of precipitation, whichever is first to occur.

Throughout the winter season, active soil-disturbed areas of the project site shall be fully protected at the end of each day with soil stabilization practices and sediment control measures unless fair weather is predicted through the following work day. The weather forecast shall be monitored by the Contractor on a daily basis. The National Weather Service forecast shall be used, or an alternative weather forecast proposed by the Contractor may be used if approved by the Engineer. If precipitation is predicted prior to the end of the following work day, construction scheduling shall be modified, as required, and the Contractor shall deploy functioning control measures prior to the onset of the precipitation.

The Contractor shall implement, year-round and throughout the duration of the project, control measures included in the SWPPP for sediment tracking, wind erosion, non-storm water management and waste management and disposal.

The Engineer may order the suspension of construction operations which create water pollution if the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

MAINTENANCE.—To ensure the proper implementation and functioning of control measures, the Contractor shall regularly inspect and maintain the construction site for the control measures identified in the SWPPP. The Contractor shall identify corrective actions and time frames to address any damaged measures or reinitiate any measures that have been discontinued.

The construction site inspection checklist provided in the Handbook shall be used to ensure that the necessary measures are being properly implemented, and to ensure that the control measures are functioning adequately. The Contractor shall submit one copy of each site inspection record to the Engineer.

During the winter season, inspections of the construction site shall be conducted by the Contractor to identify deficient measures, as follows:

1. Prior to a forecast storm;
2. After each storm event;
3. At 24 hour intervals during extended precipitation events; and
4. Routinely, on a weekly basis.

If the Contractor or the Engineer identifies a deficiency in the deployment or functioning of an identified control measure, the deficiency shall be corrected by the Contractor immediately, or by a later date and time if requested by the Contractor and approved by the Engineer in writing, but not later than the onset of subsequent precipitation events. The correction of deficiencies shall be at no additional cost to the State.

PAYMENT.—The contract lump sum price paid for prepare storm water pollution prevention plan shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals for doing all the work involved in developing, preparing, obtaining approval of, revising and amending the SWPPP as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Attention is directed to Sections 9-1.06, "Partial Payments," and 9-1.07, "Payment After Acceptance," of the Standard Specifications. Payments for prepare storm water pollution prevention plan will be made as follows:

1. After the SWPPP has been approved by the Engineer, 75 percent of the contract item price for prepare storm water pollution prevention plan will be included in the monthly partial payment estimate; and
2. After acceptance of the contract pursuant to Section 7-1.17, "Acceptance of Contract," the remaining 25 percent of the contract item price for prepare storm water pollution prevention plan will be made in accordance with Section 9-1.07.

The contract lump sum price paid for water pollution control shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in installing, constructing, maintaining, removing and disposing of control measures, except those shown on the project plans and for which there is a contract item of work, and excluding developing, preparing, obtaining approval of, revising and amending the SWPPP, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Changes in control measures required by an approved amendment to the SWPPP, except changes to those control measures shown on the project plans and for which there is a contract item of work, will be considered extra work, in accordance with Section 4-1.03D of the Standard Specifications and the following:

If the control measure is listed in the approved SWPPP schedule of values, an adjustment in compensation for the contract item for water pollution control will be made by applying the increase or decrease in quantities to the approved schedule of values. No adjustment of compensation will be made to the unit price listed for any item in the schedule of values due to any increase or decrease in the quantities, regardless of the reason for the increase or decrease. The provisions in Section 4-1.03B, "Increased or Decreased Quantities," shall not apply to items listed in the schedule of values.

If the control measure is not listed in the approved SWPPP schedule of values, payment will be made by force account.

Those control measures which are shown on the project plans and for which there is a contract item of work will be measured and paid for as that item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the requirements of this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the requirements of this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the requirements of this section will be released for payment on the next monthly estimate for partial payment following the

date that an approved SWPPP has been implemented and maintained, and water pollution is adequately controlled, as determined by the Engineer.

10-1.03 COOPERATION

Attention is directed to Sections 7-1.14, "Cooperation," and 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications and these special provisions.

It is anticipated that work will be in progress by other contractors within or adjacent to the project limits of this contract.

Contracts involving the seismic retrofit of the San Francisco-Oakland Bay Bridge which may be in progress during the working period of this contract include, but are not necessarily limited to, the following:

Contract No. 04-043544. Work is located at the West Bay Bridge Caissons and at Piers W2 and W6. Construction is scheduled to begin in Winter 1998.

Contract No. 04-043004. Work involves the interim seismic retrofit of the East Bay Bridge. Construction is scheduled to begin in Spring 1998.

Contract No. 04-043564. Work is located at the West Bay Bridge Suspension Towers. Construction is scheduled to begin in Summer 1998.

Contract No. 04-043574. Work is on the Suspension Superstructure. Construction is scheduled to begin in Summer 1998.

Contract No. 04-043554. Work is located at the West Bay Bridge Suspension Anchorages and at Pier W1. Construction is scheduled to begin in Fall 1998.

Progress schedules for the above contracts and other work, when available, may be inspected by the Contractor. Such progress schedules are tentative and no guarantee can be made that such schedules are accurate.

Work by State forces will also be in progress within the contract limits during the working period for this contract.

The Contractor's operations shall be subject to coordination with the work conducted by other contractors and by State forces. The Contractor shall participate in weekly work planning discussions with bridge operations and maintenance personnel for the purpose of coordinating his work with that of other contractors and State forces, and to reach agreement on the time and location of lane closures for each following week's work.

It is anticipated that Contract No. 04-043554, in connection with seismic retrofit work on the suspension anchorages of the West Bay Bridge, will be approved during the progress of the work under this contract. The Contractor will be required to share one half the area shown on the plans and as provided for in "Areas for Contractor's Use" of these special provisions. The Engineer will notify the Contractor in writing 14 days in advance of the Contractor being required to have available one half of said area for Contract No. 04-043554. The 2 contractors shall share the one entrance.

10-1.04 PROGRESS SCHEDULE (CRITICAL PATH)

Progress schedules will be required for this contract. Progress schedules shall utilize the Critical Path Method (CPM).

Definitions - The following definitions apply to this section "Progress Schedule (Critical Path)":

- 1) Activity: Any task, or portion of a project which takes time to complete.
- 2) Baseline Schedule: The initial CPM schedule representing the Contractor's original work plan, as accepted by the Engineer.
- 3) Critical Path Method: A mathematical calculation to determine the longest path of work and relative float represented by a graphic representation of the sequence of activities that shows the interrelationships and interdependencies of the elements composing a project.
- 4) Current Contract Completion Date: The extended date for completion of the contract shown on the weekly statement of working days furnished by the Engineer in accordance with Section 8-1.06, "Time of Completion," of the Standard Specifications.
- 5) Early Completion Time: The difference in time between the current contract completion date and the Contractor's scheduled early completion date as shown on the accepted baseline schedule, or schedule updates and revisions.
- 6) Float: The amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any activity or group of activities in the network.
- 7) Fragnet: A section or fragment of the network diagram comprised of a group of activities.
- 8) Free Float: The amount of time an activity can be delayed before affecting a subsequent activity.

- 9) **Hammock Activity:** An activity added to the network to span an existing group of activities for summarizing purposes.
- 10) **Milestone:** A marker in a network which is typically used to mark a point in time or denote the beginning or end of a sequence of activities. A milestone has zero duration, but will otherwise function in the network as if it were an activity.
- 11) **Revision:** A change in the future portion of the schedule that modifies logic, adds or deletes activities, or alters activities, sequences, or durations.
- 12) **Tabular Listing:** A report showing schedule activities, their relationships, durations, scheduled and actual dates, and float.
- 13) **Total Float:** The amount of time that an activity may be delayed without affecting the total project duration of the critical path.
- 14) **Update:** The modification of the CPM progress schedule through a regular review to incorporate actual progress to date by activity, approved time adjustments, and projected completion dates.

Preconstruction Scheduling Conference - The Engineer will schedule and conduct a Preconstruction Scheduling Conference with the Contractor's Project Manager and Construction Scheduler within seven days after the bidder has received the contract for execution. At this meeting, the requirements of this section of the special provisions will be reviewed with the Contractor. The Contractor shall be prepared to discuss its schedule methodology, proposed sequence of operations, and any deviations it proposes to make from the Stage Construction Plans. At this meeting, the Contractor shall submit its proposed work breakdown structure, the associated alpha-numeric coding structure to implement the work breakdown structure and the activity identification system for labeling all work activities. The Engineer shall review and comment on the work breakdown structure, the coding structure and activity identification system within seven days after submission by the Contractor. The Contractor shall make all modifications to the proposed work breakdown structure, the coding structure and activity identification system that are requested by the Engineer, and shall employ that coding, structure and system in its baseline schedule submission.

Interim Baseline Schedule - Within 10 days after approval of the contract, the Contractor shall submit to the Engineer an interim baseline project schedule which will serve as the progress schedule for the first 120 days of the project, or until the baseline schedule is accepted, whichever is sooner. The interim baseline schedule shall utilize the critical path method. The interim baseline schedule shall depict how the Contractor plans to perform the work for the first 120 days of the contract. Additionally, the interim baseline schedule shall show all submittals required early in the project, and shall provide for all permits, and other non-work activities necessary to begin the work. The interim baseline schedule submittal shall include a 3 1/2 inch floppy diskette which contains the data files used to generate the schedule.

The Engineer shall be allowed 15 calendar days to review and accept or reject the interim baseline schedule submitted. Rejected schedules shall be resubmitted to the Engineer within 5 calendar days of receipt by the Contractor of the Engineer's comments, at which time a new 15-calendar day review period by the Engineer will begin.

Baseline Schedule - Within 30 days after approval of the contract, the Contractor shall submit to the Engineer a baseline project schedule. The baseline schedule shall include the activities shown on the interim baseline schedule in the same order and logical relationship as shown in the interim baseline schedule. The baseline project schedule shall have a data date of the day prior to the first working day of the contract and shall not include any completed work to-date. The baseline progress schedule shall meet interim target dates, milestones, stage construction requirements, internal time constraints, show logical sequence of activities, and must not extend beyond the number of days originally provided for in the contract.

The baseline CPM schedule submitted by the Contractor shall have a sufficient number of activities to assure adequate planning of the project and to permit monitoring and evaluation of progress and the analysis of time impacts. The baseline schedule shall depict how the Contractor plans to complete the whole work involved, and shall show all activities that define the critical path.

The baseline progress schedule shall be supplemented with resource allocations for every activity, to a level of detail that facilitates report generation based on labor craft and equipment class for the Contractor and subcontractors. The Contractor shall use average composite crews to display the labor loading of on-site construction activities. The Contractor shall optimize and level labor to reflect a reasonable plan for accomplishing the work of the contract and to assure that resources are not duplicated in concurrent activities. The Contractor shall require each subcontractor to submit in writing a statement certifying that the subcontractor has concurred with the Contractor's CPM, including major updates, and that the subcontractor's related schedule has been incorporated accurately, including the duration of activities and labor and equipment loading. Along with the baseline progress schedule, the Contractor shall also submit to the Engineer time-scaled resource histograms of the labor crafts and equipment classes to be utilized on the contract. The baseline schedule submittal shall include a 3 1/2 inch floppy diskette which contains the data files used to generate the schedule.

The Engineer shall be allowed 15 calendar days to review and accept or reject the baseline project schedule submitted. Rejected schedules shall be resubmitted to the Engineer within 5 calendar days, at which time a new 15-calendar day review period by the Engineer will begin.

Project Schedule Reports - Schedules submitted to the Engineer including baseline and interim baseline schedules shall include time scaled network diagrams. Network diagrams shall be based on early start and early finish dates of activities shown. The network diagrams submitted to the Engineer shall also be accompanied by the computer-generated mathematical analysis tabular reports for each activity included in the project schedule. Three different report sorts shall be provided: Early Start, Free Float, Total Float, and Activity Number, which shall show all predecessors and successors for each activity. The mathematical analysis tabular reports (8 1/2" x 11" size) shall be submitted to the Engineer and shall include, at a minimum, the following for each activity:

- 1) Data date
- 2) Predecessor and successor activity numbers and descriptions;
- 3) Activity number and description;
- 4) Activity codes;
- 5) Schedule, and actual and remaining duration for each activity;
- 6) Earliest start date (by calendar date);
- 7) Earliest finish date (by calendar date);
- 8) Actual start date (by calendar date);
- 9) Actual finish date (by calendar date);
- 10) Latest start date (by calendar date);
- 11) Latest finish date (by calendar date);
- 12) Identify actual non-working days
- 13) Identify activity calendar type
- 14) Total Float and Free Float, in work days;
- 15) Percentage of activity complete and remaining duration for incomplete activities; and
- 16) Imposed constraints.

Networks shall be drafted time scaled to show a continuous flow of information from left to right. The primary paths of criticality shall be clearly and graphically identified on the networks. The network diagram shall be prepared on E-size sheets (36" x 48"), shall have a title block in the lower right-hand corner, and a timeline on each page. Exceptions to the size of the network sheets and the use of computer graphics to generate the networks shall be subject to the approval of the Engineer.

Schedule network diagrams and computer tabulations shall be submitted to the Engineer for acceptance in the following quantities:

- a) 2 sets of the Network Diagrams;
- b) 2 copies of the computer tabulation reports (8 1/2" x 11" size); and
- c) 3 computer diskettes.

Should the baseline schedule or schedule update, submitted for acceptance, show variances from the requirements of the contract, the Contractor shall make specific mention of the variations in the letter of transmittal, in order that, if accepted, proper adjustments to the project schedule can be made. The Contractor will not be relieved of the responsibility for executing the work in strict accordance with the requirements of the contract documents. In the event of a conflict between the requirements of the contract documents and the information provided or shown on an accepted schedule, the requirements of the contract documents shall take precedence.

Each schedule submitted to the Engineer shall comply with all limits imposed by the contract, with all specified intermediate milestone and completion dates, and with all constraints, restraints or sequences included in the contract. The degree of detail shall include factors including, but not limited to:

- 1) Physical breakdown of the project;
- 2) Contract milestones and completion dates, substantial completion dates, constraints, restraints, sequences of work shown in the contract, the planned substantial completion date, and the final completion date;
- 3) Type of work to be performed, the sequences, and the major subcontractors involved;
- 4) All purchase, submittals, submittal reviews, manufacture, tests, deliver, and installation activities for all major materials and equipment.
- 5) Preparation, submittal and approval of shop and working drawings and material samples, showing time, as specified elsewhere, for the Engineer's review. The same time frame shall be allowed for at least one resubmittal on all major submittals so identified in the contract documents;

- 6) Identification of interfaces and dependencies with preceding, concurrent and follow-on contractors, railroads, and utilities as shown on the plans or specified in the specifications;
- 7) Identification of each and every utility relocation and interface as a separate activity, including activity description and responsibility coding that identifies the type of utility and the name of the utility company involved.
- 8) Actual tests, submission of test reports, and approval of test results;
- 9) All start-up, testing, training, and assistance required under the Contract;
- 10) Punchlist and final clean-up;
- 11) Identification of any manpower, material, or equipment restrictions, as well as any activity requiring unusual shift work, such as double shifts, 6-day weeks, specified overtime, or work at times other than regular days or hours; and
- 12) Identification of each and every ramp closing and opening event as a separate one-day activity, including designation by activity coding and description that it is a north-bound, south-bound, east-bound, west-bound, and entry or exit ramp activity.

Each construction activity shall have a duration of not more than 20 working days, and not less than one working day unless permitted otherwise by the Engineer. All activities in the schedule, with the exception of the first and last activities, shall have a minimum of one predecessor and a minimum of one successor. The baseline schedule shall not attribute negative float to any activity. Float shall not be considered as time for the exclusive use of or benefit of either the State or the Contractor but shall be considered as a jointly owned, expiring resource available to the project and shall not be used to the financial detriment of either party. Any accepted schedule, revision or update having an early completion date shall show the time between the early completion date and the current Contract Completion Date as "project float".

The Contractor shall be responsible for assuring that all work sequences are logical and the network shows a coordinated plan for complete performance of the work. Failure of the Contractor to include any element of work required for the performance of the contract in the network shall not relieve the Contractor from completing all work within the time limit specified for completion of the contract. If the Contractor fails to define any element of work, activity or logic, and the omission or error is discovered by either the Contractor or the Engineer, it shall be corrected by the Contractor at the next monthly update or revision of the schedule.

Monthly Update Schedules - The Contractor shall submit a Monthly Update Schedule to the Engineer once in each month. The proposed update schedule prepared by the Contractor shall include all information available as of the 20th calendar day of the month, or other date as established by the Engineer. A detailed list of all proposed schedule changes such as logic, duration, lead/lag, additions and deletions shall be submitted with the update.

The monthly update schedule submitted to the Engineer shall be accompanied by a Schedule Narrative Report. The Schedule Narrative Report shall describe the physical progress during the report period, plans for continuing the work during the forthcoming report period, actions planned to correct any negative float predictions, and an explanation of potential delays or problems and their estimated impact on performance, milestone completion dates and the overall project completion date. In addition, alternatives for possible schedule recovery to mitigate any potential delay or cost increases shall be included for consideration by the Engineer. The report shall follow the outline set forth below:

Contractor's Schedule Narrative Report Outline:

- 1) Contractor's Transmittal Letter
- 2) Work completed during the period
- 3) Description of the current critical path
- 4) Description of problem areas
- 5) Current and anticipated delays
 - a) Cause of the delay
 - b) Corrective action and schedule adjustments to correct the delay
 - c) Impact of the delay on other activities, milestones, and completion dates
- 6) Changes in construction sequences
- 7) Pending items and status thereof
 - a) Permits
 - b) Change Orders
 - c) Time Extensions
 - d) Non-Compliance Notices
- 8) Contract completion date(s) status
 - a) Ahead of schedule and number of days
 - b) Behind schedule and number of days

9) Include updated Network Diagram and Reports

The Contractor shall provide to the Engineer a 3 1/2" electronic disk of the schedule, together with printed copies of the network diagrams and tabular reports described under "Project Schedule Reports", and the Schedule Narrative Report.

The monthly update of the schedule shall be for the period from the last update to the current cut-off date, and for the remainder of the project. The current period's activities shall be reported as they actually took place and designated as actually complete, if actually completed, in the schedule updates.

Portions of the network diagram on which all activities are complete need not be reprinted and submitted in subsequent updates. However, the electronic disk file of the submitted schedule and the related reports shall constitute a clear record of progress of the work from award of contract to final completion.

The Contractor will be permitted to show early or late completion on schedule updates and revisions. The Engineer may use the updates and revisions, and other information available, in evaluating the effect of changes, delays, or time savings on the critical path and the accepted schedule current at the time to determine if there is an applicable adjustment of time, if any, to any target date or completion date due to the changes, delays, or time savings.

On a date determined by the Engineer, the Contractor shall meet with the Engineer to review the monthly schedule update. At the monthly progress meeting, the Contractor and the Engineer will review the updated schedule and will discuss the content of the Narrative Report. The Engineer shall be allowed 15 days after the meeting to review and accept or reject the update schedule submitted. Rejected schedules shall be resubmitted to the Engineer within 15 calendar days, at which time a new 15-calendar day review period by the Engineer will begin.

Schedule Revisions - If the Contractor desires to make a change to the accepted schedule, the Contractor shall request permission from the Engineer in writing, stating the reasons for the change, and proposed revisions to activities, logic and duration. The Contractor shall submit for acceptance the affected portions of the project schedule and an analysis to show the effect on the entire project. The Engineer will provide a response within 10 days. No revision to the accepted baseline schedule or the schedule updates shall be made without the prior written approval of the Engineer.

The Engineer will request the Contractor to submit a proposed revised schedule within 15 days when:

- a) there is a significant change in the Contractor's operations that will affect the critical path;
- b) the current updated schedule indicates that the contract progress is 30 calendar days or more behind the planned schedule, as determined by the Engineer; or
- c) the Engineer determines that an approved or anticipated change will impact the critical path, milestone or completion dates, contract progress, or work by other contractors.

The Engineer shall be allowed 15 days to review and accept or reject a schedule revision. Rejected schedule revisions shall be revised and resubmitted to the Engineer within 15 calendar days, at which time a new 15-calendar day review period by the Engineer will begin. Only upon approval of a change by the Engineer shall it be reflected in the next schedule update submitted by the Contractor.

Schedule Time Extension Requests - When the Contractor requests a time extension due to contract change orders or delays, the Contractor shall submit to the Engineer a written Time Impact Analysis illustrating the influence of each change or delay on the current contract completion date or milestone completion date, utilizing the current accepted schedule. Each Time Impact Analysis shall include a fragnet demonstrating how the Contractor proposes to incorporate the Change Order or delay into the current schedule. The fragnet shall include the sequence of new and existing activity revisions that are proposed to be added to the accepted baseline project schedule or current schedule in effect at the time the change or delay is encountered, to demonstrate the influence of the delay and the proposed method for incorporating the delay and its impact into the schedule.

Each Time Impact Analysis shall demonstrate the estimated time impact based on the events of delay, the anticipated or actual date of the contract change order work performance, the status of construction at that point in time, and the event time computation of all activities affected by the change or delay. The event times used in the analysis shall be those included in the latest update of the current schedule in effect at the time the change or delay was encountered.

Time extensions will be granted only to the extent that equitable time adjustments for the activity or activities affected exceed the total or remaining float along the critical path of activities at the time of actual delay, or at the time the contract change order work is performed. Float time is not for the exclusive use or benefit of the Engineer or the Contractor, but is an expiring resource available to all parties as needed to meet contract milestones and the contract completion date. Time extensions will not be granted nor will delay damages be paid unless:

- a) the delay is beyond the control and without the fault or negligence of the Contractor and its subcontractors or suppliers, at any tier; and,

- b) the delay extends the actual performance of the work beyond the applicable current contract completion date and the most recent date predicted for completion of the project on the accepted schedule update current as of the time of the delay or as of the time of issuance of the contract change order.

Time Impact Analyses shall be submitted in triplicate within 15 days after the delay occurs or after issuance of the contract change order.

Approval or rejection of each Time Impact Analysis by the Engineer will be made within 15 days after receipt of the Time Impact Analysis, unless the review is delayed by subsequent meetings and negotiations. A copy of the Time Impact Analysis approved by the Engineer shall be returned to the Contractor and the accepted schedule revisions illustrating the influence of the contract change orders or delays shall be incorporated into the project schedule during the first update after approval.

Final Schedule Update - Within 15 days after the acceptance of the contract by the Director, the Contractor shall submit a final update of the schedule with actual start and actual finish dates for all activities. This schedule submission shall be accompanied by a certification, signed by an officer of the company and the Contractor's Project Manager stating "To the best of my knowledge, the enclosed final update of the project schedule reflects the actual start and completion dates of the activities contained herein."

Equipment and Software - The Contractor shall provide for the State's exclusive possession and use a complete computer system specifically capable of creating, storing, updating and producing CPM schedules. Before delivery and setup of the computer system, the Contractor shall submit to the Engineer for approval a detailed list of all computer hardware and software the Contractor proposes to furnish. The minimum computer system to be furnished shall include the following:

- 1) Complete computer system, including keyboard, mouse, 17 inch color SVGA monitor (1,024x768 pixels), Intel Pentium 200 MHZ micro processor chip, or equivalent, or better;
- 2) Computer operating system software, compatible with the selected processing unit, for Windows 95 or later, or equivalent;
- 3) Minimum sixty-four (64) megabytes of random access memory (RAM);
- 4) A two-gigabyte minimum hard disk drive, a 1.44 megabyte 3 1/2 inch floppy disk drive, 16x speed minimum CD-ROM drive, ethernet card and 33.6 / 14.4 modem;
- 5) A color-ink-jet plotter with a minimum 8 megs RAM, capable of 300 dots per inch color, 600 dots per inch monochrome, or equivalent plotter capable of printing fully legible, timescaled charts, and network diagrams, in four colors, with a minimum size of 36 inches by 48 inches (E size) and is compatible with the selected system; and
- 6) CPM software shall be Primavera Project Planner, version 2.0 for Windows 95, or later.

The computer hardware and software furnished shall be compatible with that used by the Contractor for the production of the CPM progress schedule required by the Contract, and shall include original instruction manuals and other documentation normally provided with the software.

The Contractor shall furnish, install, set up, maintain and repair the computer hardware and software ready for use at a location determined by the Engineer. The hardware and software shall be installed and ready for use by the first submission of the baseline schedule. The Contractor shall provide 24 hours of formal training for the Engineer in the use of the hardware and software to include schedule analysis, reporting, resource and cost allocations.

All computer hardware and software furnished shall remain the property of the Contractor and shall be removed by the Contractor upon acceptance of the contract when no claims involving contract progress are pending. When claims involving contract progress are pending, computer hardware or software shall not be removed until the final estimate has been submitted to the Contractor.

Payment - Progress schedule (critical path) will be paid for at a lump sum price. The contract lump sum price paid for progress schedule (critical path) shall include full compensation for furnishing all labor, materials (including computer hardware and software), tools, equipment, and incidentals; and for doing all the work involved in preparing, furnishing, updating and revising CPM progress schedules; maintaining and repairing the computer hardware; and training the Engineer in the use of the computer hardware and software; as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Payments for progress schedule (critical path) will be made as follows:

Contract No. 04-043474

Interim baseline schedule accepted, then 10 percent payment for progress schedule (critical path) will be made.
 Baseline schedule accepted, then 10 percent payment for progress schedule (critical path) will be made.
 Monthly update schedules accepted, then 75 percent payment for progress schedule (critical path) will be made equally for each update.
 Final schedule update accepted, then 5 percent payment for progress schedule (critical path) will be made.

The Department will retain an amount equal to 25 percent of the estimated value of the work performed during the first estimate period in which the Contractor fails to submit an interim baseline, baseline, revised or updated CPM schedule conforming to the requirements of this section, as determined by the Engineer. Thereafter, on subsequent successive estimate periods the percentage the Department will retain will be increased at the rate of 25 percent per estimate period in which acceptable CPM progress schedules have not been submitted to the Engineer. Retentions for failure to submit acceptable CPM progress schedules shall be additional to all other retentions provided for in the contract. The retention for failure to submit acceptable CPM progress schedules will be released for payment on the next monthly estimate for partial payment following the date that acceptable CPM progress schedules are submitted to the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of progress schedule (critical path). Adjustments in compensation for the project schedule will not be made for any increased or decreased work ordered by the Engineer in furnishing project schedules.

10-1.05 OBSTRUCTIONS

Attention is directed to Sections 8-1.10, "Utility and Non-Highway Facilities," and 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

The Contractor's attention is directed to the existence of certain underground facilities that may require special precautions be taken by the Contractor to protect the health, safety and welfare of workmen and of the public. Facilities requiring special precautions include, but are not limited to: conductors of petroleum products, oxygen, chlorine, and toxic or flammable gases; natural gas in pipelines greater than 150 mm (6 inches) in diameter or pipelines operating at pressures greater than 415 kPa (60 psi) gauge; underground electric supply system conductors or cables, with potential to ground of more than 300 volts, either directly buried or in duct or conduit which do not have concentric grounded conductors or other effectively grounded metal shields or sheaths.

The Contractor shall notify the Engineer and the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to performing any excavation or other work close to any underground pipeline, conduit, duct, wire or other structure. Regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

The following utility facilities will be relocated during the progress of the contract. The Contractor shall notify the Engineer in writing prior to doing any work in the vicinity of the facility. The utility facility will be relocated within the listed working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications, after said notification is received by the Engineer.

Utility	Location	Working Days
15 kV Shielded Single Conductor Power Cable	35' right of Sta 152+83 to 52' right of Sta 155+55	29
1-50 #19 Shielded Twisted Pair Conductor Cable	42' right of Sta 152+90 to 36' right of Sta 155+98	42
1-40 #16 Conductor Cable	41' right of Sta 152+93 to 36' right of Sta 155+88	42
1-40 #16 Conductor Cable	41' right of Sta 152+93 to 36' right of Sta 155+88	42
1-40 #16 Conductor Cable	54' right of Sta 153+61 to 36' right of Sta 155+95	27
ISG		7
4-fv		1
1-40 #16 Conductor Cable	42' right of Sta 152+90 to 54' right of Sta 153+61	15
ISG		7
4-fv		4
1-500 kcmil	31' right of Sta 152+74 to 48' right of Sta 155+95	26
4-triplexed #6	37' right of Sta 152+79 to 36' right of Sta 155+82	25
2-duplexed #6	37' right of Sta 152+79 to 36' right of Sta 155+82	25
1-triplexed #6		2

Installation of the following utility facilities will require coordination with the Contractor's operations. The Contractor shall make necessary arrangements with the utility company, through the Engineer, and shall submit a schedule of work, verified by a representative of the utility company, to the Engineer. The schedule of work shall provide not less than the following number of working days, as defined in Section 8-1.06, "Time of Completion," of the Standard Specifications for the utility company to complete their work.

Utility (Address)	Location	Working Days
MCI Telecommunication Corporation Network MCI Services 2270 Lakeside Blvd Richardson, TX 75082 (972) 918-1400	136' left of Sta 153+77 to 34' left of Sta 155+60	9

In the event that the utility facilities mentioned above are not removed or relocated by the times specified and, if in the opinion of the Engineer, the Contractor's operations are delayed or interfered with by reason of the utility facilities not being removed or relocated by said times, the State will compensate the Contractor for such delays to the extent provided in Section 8-1.09, "Right of Way Delays," of the Standard Specifications, and not otherwise, except as provided in Section 8-1.10, "Utility and Non-Highway Facilities," of the Standard Specifications.

10-1.06 MOBILIZATION

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications.

10-1.07 CONSTRUCTION AREA SIGNS

Construction area signs shall be furnished, installed, maintained, and removed when no longer required in accordance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

The Contractor shall notify the appropriate regional notification center for operators of subsurface installations at least 2 working days, but not more than 14 calendar days, prior to commencing any excavation for construction area sign posts. The regional notification centers include but are not limited to the following:

Notification Center	Telephone Number
Underground Service Alert-Northern California (USA)	1-800-642-2444 1-800-227-2600
Underground Service Alert-Southern California (USA)	1-800-422-4133 1-800-227-2600

All excavations required to install construction area signs shall be performed by hand methods without the use of power equipment, except that power equipment may be used if it is determined there are no utility facilities in the area of the proposed post holes.

Sign substrates for stationary mounted construction area signs may be fabricated from fiberglass reinforced plastic as specified under "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Type IV reflective sheeting for sign panels for portable construction area signs shall conform to the requirements specified under "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

10-1.08 MAINTAINING TRAFFIC

Attention is directed to Sections 7-1.08, "Public Convenience," 7-1.09, "Public Safety," and 12, "Construction Area Traffic Control Devices," of the Standard Specifications and to the Section entitled "Public Safety" elsewhere in these special provisions, and these special provisions. Nothing in these special provisions shall be construed as relieving the Contractor from the responsibilities specified in Section 7-1.09.

The Contractor shall provide the Engineer, prior to establishing a lane closure, a contingency plan in the event of an equipment breakdown or materials failure which would delay opening the lane or lanes within the time limits specified elsewhere in these special provisions. Such contingency plan should include standby equipment and stockpiled materials for temporary use.

Acceptance of the contingency plan by the Engineer shall not relieve the Contractor from the requirement of opening the lane or lanes to public traffic as specified in "Traffic Control System for Lane Closure" of these special provisions. Full compensation for providing the contingency plan and implementing the plan shall be considered as included in the various items of work requiring lane closures.

Should the Contractor fail to provide all lanes ready for use by public traffic at the times specified in the Lane Closure Charts included in "Maintaining Traffic" of these special provisions, damages will be assessed. For each 10 minute period, or fraction thereof, that all lanes are not available for use by public traffic as delineated in the charts, the amount of liquidated damages assessed will be \$7,700. The maximum amount of such assessment will be \$139,000 per day, and the Department will deduct such amount from any payments due or to become due the Contractor. It is expressly agreed by the parties that these specific damages to public traffic are uncertain and cannot be ascertained with any degree of accuracy and that, therefore, they are liquidated damages established at the time of entering the contract.

The minimum size specified for Type II flashing arrow signs in the table following the second paragraph of Section 12-3.03, "Flashing Arrow Signs," of the Standard Specifications is amended to read "36 inches by 72 inches".

In the Standard Plans, Note 10 on Standard Plan T10, Note 9 on Standard Plan T10A, Note 5 on Standard Plan T11, Note 6 on Standard Plan T12, Note 5 on Standard Plan T13, and Note 4 on Standard Plan T14 are revised to read:

All traffic cones used for night lane closures shall have reflective cone sleeves as specified in the specifications.

The second and third paragraphs of Section 12-3.10, "Traffic Cones," of the Standard Specifications are amended to read:

During the hours of darkness traffic cones shall be affixed with reflective cone sleeves. The reflective sheeting of sleeves on the traffic cones shall be visible at 1,000 feet at night under illumination of legal high beam headlights, by persons with vision of or corrected to 20/20.

Reflective cone sleeves shall conform to the following:

1. Removable flexible reflective cone sleeves shall be fabricated from the reflective sheeting specified in the special provisions, have a minimum height of 13 inches and shall be placed a maximum of 3 inches from the top of the cone. The sleeves shall not be in place during daylight hours.
2. Permanently affixed semitransparent reflective cone sleeves shall be fabricated from the semitransparent reflective sheeting specified in the special provisions, have a minimum height of 13

inches, and shall be placed a maximum of 3 inches from the top of the cone. Traffic cones with semitransparent reflective cone sleeves may be used during daylight hours.

3. Permanently affixed double band reflective cone sleeves shall have 2 white reflective bands. The top band shall be 6 inches in height, placed a maximum of 4 inches from the top of the cone. The lower band shall be 4 inches in height, placed 2 inches below the bottom of the top band. Traffic cones with double band reflective cone sleeves may be used during daylight hours.

The type of reflective cone sleeve used shall be at the option of the Contractor. Only one type of reflective cone sleeve shall be used on the project.

The C16 and C17 designations of the signs shown on the detail "Entrance Ramp Without Turning Pockets" of Standard Plan T14 are amended to designate the signs as R16 and R17, respectively.

Lane closures shall conform to the provisions in the section of these special provisions entitled "Traffic Control System for Lane Closure."

On or before Monday of each week, the Contractor shall furnish to the Engineer a schedule of all proposed lane closures for the following week. Any requests for changes to the weekly schedule shall be submitted to the Engineer for approval at least 24 hours prior to the proposed change.

The Contractor's attention is directed to "Cooperation" elsewhere in these special provisions regarding weekly meetings with bridge operations and maintenance personnel.

Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders, including any section closed to public traffic.

Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed as shown on the plans.

Lanes shall be closed only during the hours shown on the charts included in this section "Maintaining Traffic." Except work required under said Sections 7-1.08 and 7-1.09, work that interferes with public traffic shall be performed only during the hours shown for lane closures.

Treasure Island off ramp shall be closed and public traffic detoured as shown in the plans during Stage 1 of construction.

Advance information signs (with dates and time of closure) informing public traffic of future ramp closures shall be installed as shown on the plans, a minimum of 7 days in advance of the intended ramp closure.

Designated legal holidays are: January 1st, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When November 11th falls on a Saturday, the preceding Friday shall be a designated legal holiday.

Minor deviations from the requirements of this section concerning hours of work which do not significantly change the cost of the work may be permitted upon the written request of the Contractor if in the opinion of the Engineer public traffic will be better served and the work expedited. Such deviations shall not be adopted until the Engineer has indicated his written approval. All other modifications will be made by contract change order.

LANE CLOSURE CHART NO. 1

DIRECTION: Eastbound		LOCATION: On I-80 - West of the San Francisco - Oakland Bay Bridge Toll Plaza																								
Lane Requirements and Hours of Work																										
		Midnight	1:00 PM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	Noon	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Midnight
Mondays through Thursdays																										
Fridays																										
Saturdays																										
Sundays																										
Days Before Designated Legal Holidays																										
Designated Legal Holidays																										

Legend:

- Provide at least two adjacent traffic lanes.
- Provide at least three adjacent traffic lanes.
- Provide at least four adjacent traffic lanes.
- Provide at least four adjacent lanes of traffic.
(see remarks)
- No lane closure permitted.

REMARKS:

Weekday daytime lane closure subject to the following:
1) May not be installed between 0700 and 0900 (if the closure is not already in place by 0700, installation of closure CAN NOT begin until after 0900).

LANE CLOSURE CHART NO. 2

DIRECTION: Westbound		LOCATION: On I-80 - West of the San Francisco - Oakland Bay Bridge Toll Plaza																									
Lane Requirements and Hours of Work																											
		Midnight	11:00 PM	10:00 PM	9:00 PM	8:00 PM	7:00 PM	6:00 PM	5:00 PM	4:00 PM	3:00 PM	2:00 PM	1:00 PM	Noon	11:00 AM	10:00 AM	9:00 AM	8:00 AM	7:00 AM	6:00 AM	5:00 AM	4:00 AM	3:00 AM	2:00 AM	1:00 AM	Midnight	
Mondays through Thursdays																											
Fridays																											
Saturdays																											
Sundays																											
Days Before Designated Legal Holidays																											
Designated Legal Holidays																											

Legend:

- Provide at least one traffic lane.
- Provide at least two adjacent traffic lanes.
- Provide at least three adjacent traffic lanes.
- Provide at least four adjacent traffic lanes.
- No lane closure permitted.

REMARKS:

10-1.09 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

A traffic control system shall consist of closing traffic lanes and ramps in accordance with the details shown on the plans, the provisions of Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the provisions under "Maintaining Traffic" and "Construction Area Signs" elsewhere in these special provisions and these special provisions.

The provisions in this section will not relieve the Contractor from the responsibility to provide such additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety," of the Standard Specifications.

During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving type lane closures. During all other operations traffic shall be controlled with stationary type lane closures. The Contractor's attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," of the Standard Specifications.

If any component in the traffic control system is displaced, or ceases to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the component to its original condition or replace the component and shall restore the component to its original location.

STATIONARY TYPE LANE CLOSURE.--When lane and ramp closures are made for work periods only, at the end of each work period, all components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder. If the Contractor so elects, the components may be stored at selected central locations, approved by the Engineer, within the limits of the highway right of way.

Each vehicle used to place, maintain and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining, or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The sign shall be controllable by the operator of the vehicle while the vehicle is in motion. The flashing arrow sign shown on the plans shall not be used on the vehicles which are doing the placing, maintaining and removing of components of a traffic control system, and shall be in place before a lane closure requiring its use is completed.

MOVING TYPE LANE CLOSURE.--Flashing arrow signs used in moving lane closures shall be truck-mounted. Changeable message signs used in moving lane closure operations shall conform to Section 12-3.12, "Portable Changeable Message Signs," of the Standard Specifications, except the signs shall be truck-mounted and the full operation height of the bottom of the sign may be less than 7 feet above the ground, but should be as high as practicable.

Truck-mounted crash cushions (TMCC) for use in moving lane closures shall be any of the following approved models, or equal:

(1)

Hexfoam TMA Series 3000 and Alpha 1000 TMA Series 1000 and Alpha 2001 TMA Series 2001

Manufacturer:	Distributor(Northern):	Distributor(Southern):
Energy Absorption Systems, Inc. One East Wacker Drive Chicago, IL 60601-2076 Telephone (312) 467-6750	Traffic Control Service, Inc. 8585 Thys Court Sacramento, CA 95828 Telephone (800) 884-8274 FAX (916) 387-9734	Traffic Control Service, Inc. 1881 Betmor Lane Anaheim, CA 92805 Telephone (800) 222-8274

(2)

Cal T-001 Model 2 or Model 3

Manufacturer:

Hexcel Corporation
11711 Dublin Blvd.
P.O. Box 2312
Dublin, CA 94568
Telephone (510) 828-4200

Distributor:

Hexcel Corporation
11711 Dublin Blvd.
P.O. Box 2312
Dublin, CA 94568
Telephone (510) 828-4200

(3)

Renco Rengard Model Nos. CAM 8-815 and RAM 8-815

Manufacturer:

Renco Inc.
1582 Pflugerville Loop Road
P.O. Box 730
Pflugerville, TX 78660-0730
Telephone (800) 654-8182

Distributor:

Renco Inc.
1582 Pflugerville Loop Road
P.O. Box 730
Pflugerville, TX 78660-0730
Telephone (800) 654-8182

Each TMCC shall be individually identified with the manufacturer's name, address, TMCC model number, and a specific serial number. The names and numbers shall each be a minimum 1/2 inch high, and located on the left (street) side at the lower front corner. The TMCC shall have a message next to the name and model number in 1/2 inch high letters which states, "The bottom of this TMCC shall be _____ inches \pm _____ inches above the ground at all points for proper impact performance." Any TMCC which is damaged or appears to be in poor condition shall not be used unless recertified by the manufacturer. The Engineer shall be the sole judge as to whether used TMCCs supplied under this contract need recertification. Each unit shall be certified by the manufacturer to meet the requirements for TMCCs in accordance with the standards established by the Transportation Laboratory Structures Research Section.

Approvals for new TMCC designs proposed as equal to the above approved models shall be in accordance with the procedures (including crash testing) established by the Transportation Laboratory Structures Research Section. For information regarding submittal of new designs for evaluation contact:

Transportation Laboratory
Structures Research Section
P.O. Box 19128
5900 Folsom Boulevard
Sacramento, CA 95819

New TMCCs proposed as equal to approved TMCCs or approved TMCCs determined by the Engineer to need recertification shall not be used until approved or recertified by the Transportation Laboratory Structures Research Section.

PAYMENT.--The contract lump sum price paid for traffic control system shall include full compensation for furnishing all labor, materials (including signs), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing and disposing of the components of the traffic control system as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

The adjustment provisions in Section 4-1.03, "Changes," of the Standard Specifications, shall not apply to the item of traffic control system. Adjustments in compensation for traffic control system will be made only for increased or decreased traffic control system required by changes ordered by the Engineer and will be made on the basis of the cost of the increased or decreased traffic control necessary. Such adjustment will be made on a force account basis as provided in Section 9-1.03, "Force Account Payment," of the Standard Specifications for increased work, and estimated on the same basis in the case of decreased work.

Traffic control system required by work which is classed as extra work, as provided in Section 4-1.03D of the Standard Specifications, will be paid for as a part of the extra work.

10-1.10 TEMPORARY RAILING

Temporary railing (Type K) shall be placed at the locations shown on the plans, specified in these special provisions or in the Standard Specifications or ordered by the Engineer, and shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Temporary railing (Type K) fabricated prior to January 1, 1993, with one longitudinal No. 5 reinforcing steel bar near the top in lieu of the 2 longitudinal No. 5 reinforcing steel bars near the top, as shown on the plans, may be used.

The Contractor's attention is directed to the provisions in "Public Safety," "Order of Work," and "Temporary Crash Cushion Module" elsewhere in these special provisions.

Temporary railing (Type K) placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions will not be measured nor paid for.

Reflectors for temporary railing (Type K) shall be furnished by the Contractor. Reflectors shall be, at the option of the Contractor, one of the non-impactable concrete delineators listed in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions. Adhesive for mounting reflectors shall be per manufacturers recommendations and as approved by the Engineer.

Full compensation for reflectors and adhesive shall be considered as included in the contract price paid per linear foot for temporary railing (Type K) and no separate payment will be made therefor.

10-1.11 CHANNELIZERS

Channelizers shall be surface mounted type and shall be furnished, placed and maintained at the locations shown on the plans and shall conform to the provisions in Sections 12, "Construction Area Traffic Control Devices," of the Standard Specifications and these special provisions.

Channelizers shall conform to the provisions in "Prequalified and Tested Signing and Delineation Materials," elsewhere in these special provisions.

Channelizer posts shall be orange in color.

At the option of the Contractor, channelizer bases may be cemented to the pavement using hot melt bitumen adhesive and in the same manner provided for cementing pavement markers to pavement in the section of these special provisions entitled "Pavement Markers."

10-1.12 TEMPORARY CRASH CUSHION MODULE

This work shall consist of furnishing, installing and maintaining sand filled temporary crash cushion modules in groupings or arrays at each location shown on the plans, specified in the special provisions or directed by the Engineer. The grouping or array of sand filled modules shall form a complete sand filled temporary crash cushion in accordance with the details shown on the plans and these special provisions.

Attention is directed to "Public Safety" "Order of Work" and "Temporary Railing" of these special provisions.

GENERAL.--Whenever the work or the Contractor's operations establishes a fixed obstacle, the exposed fixed obstacle shall be protected with a sand filled temporary crash cushion. The sand filled temporary crash cushion shall be in place prior to opening the lanes adjacent to the fixed obstacle to public traffic.

Sand filled temporary crash cushions shall be maintained in place at each location, including times when work is not actively in progress. Sand filled temporary crash cushions may be removed during a work period for access to the work provided that the exposed fixed obstacle is 15 feet or more from a lane carrying public traffic and the temporary crash cushion is reset to protect the obstacle prior to the end of the work period in which the fixed obstacle was exposed. When no longer required, as determined by the Engineer, sand filled temporary crash cushions shall be removed from the site of the work.

MATERIALS.--At the Contractor's option, the modules for use in sand filled temporary crash cushions shall be either of the following types or equal:

Energite Inertial Modules

Manufacturer:	Distributor(Northern):	Distributor(Southern):
Energy Absorption Systems, Inc. One East Wacker Drive Chicago, IL 60601-2076 Telephone (312) 467-6750	Traffic Control Service, Inc. 8585 Thys Court Sacramento, CA 95828 Telephone (800) 884-8274 FAX (916) 387-9734	Traffic Control Service, Inc. 1881 Betmor Lane Anaheim, CA 92805 Telephone (800) 222-8274

or Fitch Inertial Modules

National Distributor:

Roadway Safety Service, Inc.
700-3 Union Parkway
Ronkonkoma, NY 11779

Distributor:

Singletree Sales Company
1533 Berger Drive
San Jose, CA 95112
Telephone (800) 822-7735

Modules contained in each temporary crash cushion shall be of the same type at each location. The color of the modules shall be the standard yellow color as furnished by the vendor, with black lids. The modules shall exhibit good workmanship free from structural flaws and objectionable surface defects. The modules need not be new. Good used undamaged modules conforming to color and quality of the types specified above may be utilized. If used Fitch modules requiring a seal are furnished, the top edge of the seal shall be securely fastened to the wall of the module by a continuous strip of heavy duty tape.

Modules shall be filled with sand in accordance with the manufacturer's directions, and to the sand capacity in pounds for each module as shown on the plans. Sand for filling the modules shall be clean washed concrete sand of commercial quality. At the time of placing in the modules, the sand shall contain not more than 7 percent water, as determined by California Test 226.

Modules damaged due to the Contractor's operations shall be repaired immediately by the Contractor at his expense. Modules damaged beyond repair, as determined by the Engineer, due to the Contractor's operations shall be removed and replaced by the Contractor at his expense.

INSTALLATION.--Temporary crash cushion modules shall be placed on movable pallets or frames conforming to the dimensions shown on the plans. The pallets or frames shall provide a full bearing base beneath the modules. The modules and supporting pallets or frames shall not be moved by sliding or skidding along the pavement or bridge deck.

A Type R or P marker panel shall be attached to the front of the crash cushion as shown on the plans, when the closest point of crash cushion array is within 12 feet of the traveled way. The marker panel, when required, shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

At the completion of the project, temporary crash cushion modules, sand filling, pallets or frames, and marker panels shall become the property of the Contractor and shall be removed from the site of the work. Temporary crash cushion modules shall not be installed in permanent work.

MEASUREMENT AND PAYMENT.--Temporary crash cushion modules will be measured by the unit determined from the actual count of modules used in the work or ordered by the Engineer at each location. Temporary crash cushion modules placed in accordance with the provisions in "Public Safety" elsewhere in these special provisions and modules placed in excess of the number specified or shown will not be measured nor paid for.

Repairing modules damaged by public traffic will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications. Modules damaged beyond repair by public traffic, when ordered by the Engineer, shall be removed and replaced immediately by the Contractor. Modules replaced due to damage by public traffic will be measured and paid for as temporary crash cushion module.

If the Engineer orders a lateral move of sand filled temporary crash cushions and the repositioning is not shown on the plans, moving the sand filled temporary crash cushion will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications and such temporary crash cushion modules will not be counted for payment in the new position.

The contract unit price paid for temporary crash cushion module shall include full compensation for furnishing all labor, materials (including sand, pallets or frames and marker panels), tools, equipment and incidentals, and for doing all work involved in furnishing, installing, maintaining, moving and resetting during a work period for access to the work, and removing from the site of the work when no longer required (including those damaged by public traffic) the sand filled temporary crash cushion modules, complete in place, as shown on the plans, as specified in these special provisions and as directed by the Engineer.

10-1.13 EXISTING HIGHWAY FACILITIES

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities," of the Standard Specifications and these special provisions.

Plans of the existing bridges may be requested by fax from the Office of Structure Maintenance and Investigations, 1801 30th Street, Sacramento, CA, Fax (916) 227-8357.

Plans of existing bridges available to the Contractor are reproductions of the original contract plans with significant changes noted and working drawings and do not necessarily show normal construction tolerances and variances. Where

dimensions of new construction required by this contract are dependent on the dimensions of existing bridges, the Contractor shall verify the controlling field dimensions and shall be responsible for adjusting dimensions of the work to fit existing conditions.

Existing footing concrete which is below ground and outside of the footing limits shown on the contract plans or original contract plans shall be removed as directed by the Engineer and such work will be paid for as extra work as provided in Section 4-1.03D of the Standard Specifications.

The existing paint systems on Bridge Number 54-0004 consist of lead, zinc, chlorinated rubber, phenolic aluminum and water based paint. Any work that disturbs the existing paint system will expose workers to health hazards and will (1) produce debris containing heavy metal in amounts that exceed the thresholds established in Titles 8 and 22 of the California Code of Regulations or (2) produce toxic fumes when heated. All debris produced when the existing paint system is disturbed shall be contained.

DEBRIS CONTAINMENT AND COLLECTION PROGRAM.-- Prior to starting work, the Contractor shall submit to the Engineer a debris containment and collection program for debris produced when the existing paint system is disturbed in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The program shall identify materials, equipment and methods to be used when the existing paint system is disturbed and shall include working drawings of any containment system, loads applied to the bridge by any containment structure, and provisions for ventilation and air movement for visibility and worker safety.

If the measures being taken by the Contractor are inadequate to provide for the containment and collection of debris produced when the existing paint system is disturbed, the Engineer will direct the Contractor to revise the operations and the debris containment and collection program. The directions will be in writing and will specify the items of work for which the Contractor's debris containment and collection program are inadequate. No further work shall be performed on the items until the debris containment and collection programs are adequate and, if required, a revised program has been approved for the containment and collection of debris produced when the existing paint system is disturbed.

The Engineer will notify the Contractor of the approval or rejection of any submitted or revised debris containment and collection program within 2 weeks of submittal of the Contractor's program or revised program.

The State will not be liable to the Contractor for failure to approve all or any portion of an originally submitted or revised debris containment and collection program, nor for any delays to the work due to the Contractor's failure to submit acceptable programs.

SAFETY AND HEALTH PROVISIONS.--Attention is directed to Section 7-1.06, "Safety and Health Provisions," of the Standard Specifications. Work practices and worker health and safety shall conform to the Construction Safety Orders Title 8, of the California Code of Regulations including Section 1532.1, "Lead."

The Contractor shall furnish to the Engineer a written Code of Safe Practices, and have an Injury and Illness Prevention Program, and a Hazard Communication Program in accordance with the provisions of Construction Safety Orders 1509 and 1510.

Prior to starting work that disturbs the existing paint system and at such times when revisions to the program are required by Section 1532.1, "Lead," the Contractor shall submit the compliance programs required in subsection (e)(2), "Compliance Program," of Section 1532.1, "Lead," of the Construction Safety Orders to the Engineer in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The compliance programs shall include the data specified in subsections (e)(2)(B) and (e)(2)(C) of Section 1532.1, "Lead." Approval of the compliance programs by the Engineer will not be required. The compliance programs shall be reviewed and signed by a Certified Industrial Hygienist (CIH) who is certified in comprehensive practice by the American Board of Industrial Hygiene (ABIH). Copies of all air monitoring or jobsite inspection reports made by or under the direction of the CIH in accordance with Section 1532.1, "Lead," shall be furnished to the Engineer within 10 days after date of monitoring or inspection.

DEBRIS HANDLING.--Temporary storage on the ground of the debris produced when the existing paint system is disturbed will not be permitted. Debris accumulated inside the containment system shall be removed before the end of each work shift. Debris shall be stored in approved leak proof containers and shall be handled in such a manner that no spillage will occur.

Disposal of debris produced when the existing paint system is disturbed shall be performed in accordance with all applicable Federal, State and Local hazardous waste laws. Laws that govern this work include:

1. Health and Safety Code, Division 20, Chapter 6.5 (California Hazardous Waste Control Act).
2. Title 22; California Code of Regulations, Chapter 30 (Minimum Standard for Management of Hazardous and Extremely Hazardous Materials).
3. Title 8, California Code of Regulations.

Except as otherwise provided below, debris produced when the existing paint system is disturbed shall be disposed of by the Contractor at an approved Class 1 disposal facility in accordance with the requirements of the disposal facility operator. The debris shall be hauled by a transporter currently registered with the California Department of Toxic Substances Control using correct manifesting procedures and vehicles displaying current certification of compliance. The Contractor shall make all arrangements with the operator of the disposal facility and perform any testing of the debris required by the operator.

At the option of the Contractor, the debris produced when the existing paint system is disturbed shall be disposed of by the Contractor at a facility equipped to recycle the debris, subject to the following requirements:

Copper slag abrasive blended by the supplier with a calcium silicate compound shall be used for blast cleaning.

The debris produced when the existing paint system is disturbed shall be tested by the Contractor to confirm that the solubility of the heavy metals is below regulatory limits and that the debris may be transported to the recycling facility as a non-hazardous waste.

The Contractor shall make all arrangements with the operator of the recycling facility and perform any testing of the debris produced when the existing paint system is disturbed that is required by the operator.

WORK AREA MONITORING.--The Contractor shall perform work area monitoring of the ambient air and soil in and around the work area at the bridge site to verify the effectiveness of the containment system. The work area monitoring shall consist of collecting, analyzing and reporting of air and soil test results, and recommending any required corrective action when specified exposure levels are exceeded. The work area monitoring shall be carried out under the direction of a CIH. The samples shall be collected at locations designated by the Engineer.

Air samples shall be collected and analyzed in accordance with National Institute for Occupational Safety and Health (NIOSH) methods. Lead air samples shall be collected and analyzed in accordance with NIOSH Method 7082, with a limit of detection of at least $0.5 \mu\text{g}/\text{m}^3$. Air samples for other metals shall be collected and analyzed in accordance with NIOSH Method 7300, with a limit of detection of at least one percent of the appropriate Permissible Exposure Limits (PELs) of California/Occupational Safety and Health Administration (Cal/OSHA). Alternative methods of sample collection and analysis, with equivalent limits of detection, may be used at the option of the Contractor.

The airborne metals exposure, outside either the containment system or work areas, shall not exceed the lower of either: (1) 10 percent of the Action Level specified for lead by Section 1532.1, "Lead," or (2) 10 percent of the appropriate PELs specified for other metals by Cal/OSHA.

The air samples shall be collected at least once per week during progress of work that disturbs the existing paint system. All air samples shall be analyzed within 48 hours at a facility accredited by the Environmental Lead Laboratory Accreditation Program of the American Industrial Hygiene Association (AIHA). When corrective action is recommended by the CIH, additional samples may be required by the Engineer to be taken, at the Contractor's expense.

Eight soil samples shall be collected prior to start of work, and 8 soil samples shall be collected within 36 hours following completion of cleaning operations of existing structural steel. Where the cleaning operations extend over large areas of soil or many separate areas of soil at each bridge site, the samples shall be collected at various times during the contract, as determined by the Engineer. A soil sample shall consist of 5 plugs, each 3/4 inch diameter and 1/2 inch deep, taken at each corner and center of a one foot square area. Soil samples shall be analyzed for total lead, zinc, and aluminum in accordance with Method 3050 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846 published by the United States Environmental Protection Agency.

There shall be no increase in the concentrations of heavy metal in the soil in the area affected when the existing paint system is disturbed. When soil sampling, after completion of work that disturbs the existing paint system, shows an increase in the concentrations of heavy metal, the area affected shall be cleaned and resampled at the Contractor's expense until soil sampling and testing shows concentrations of heavy metal less than or equal to the concentrations collected prior to start of work.

In areas where there is no exposed soil, there shall be no visible increase in the concentrations of heavy metal on the area affected when the existing paint system is disturbed. Any visible increase in the concentrations of heavy metal, after completion of work that disturbs the existing paint system, shall be removed at the Contractor's expense.

Air and soil sample laboratory analysis results, including results of additional samples taken after corrective action as recommended by the CIH, shall be submitted to the Engineer. The results shall be submitted both verbally within 48 hours after sampling and in writing with a copy to the Contractor, within 5 days after sampling. Sample analysis reports shall be prepared by the CIH as follows:

For both air and soil sample laboratory analysis results, the date and location of sample collection, sample number, contract number, bridge number, full name of the structure as shown on the contract plans, and District-County-Route-Post mile will be required.

For air sample laboratory analysis results, the following will be required:

1. List of emission control measures in place when air samples were taken.
2. Air sample results shall be compared to the appropriate PELs.
3. Chain of custody forms.
4. Corrective action recommended by the CIH to ensure airborne metals exposure, outside either the containment system or work areas, is within specified limits.

For soil sample laboratory analysis results, the concentrations of heavy metal expressed as parts per million will be required.

CONTAINMENT SYSTEM.--The containment system shall consist of, at the option of the Contractor, (1) a ventilated containment structure, or (2) vacuum shrouded surface preparation equipment and drapes, tarps or other materials, or (3) equivalent containment system. The containment system shall contain all water, resulting debris, and visible dust produced when the existing paint system is disturbed.

For bridges over water, the containment system shall include a skimming boom consisting of a float with a skirt to collect floating debris.

The containment system shall provide the clearances specified under "Maintaining Traffic" of these special provisions, except that when no clearances are specified a vertical clearance of 15 feet and a horizontal clearance of 32 feet shall be provided for the passage of public traffic.

Falsework or supports for the ventilated containment structure shall not extend below the vertical clearance level nor to the ground line at any location within the roadbed.

The ventilated containment structure shall conform to the provisions for falsework in Section 51-1.06, "Falsework," of the Standard Specifications.

The minimum total design load of the ventilated containment structure shall consist of the sum of the dead and live vertical loads. Dead load shall consist of the actual weight of the ventilated containment structure. Live loads shall consist of a uniform load of not less than 45 pounds per square foot, which includes 20 pounds per square foot of sand load, applied over the area supported, and in addition, a moving 1000 pound concentrated load shall be applied to produce maximum stress in the main supporting elements. Assumed horizontal loads need not be included in the design of the ventilated containment structure.

The ventilated containment structure may be supported with either rigid or flexible supports. The rigid or flexible containment materials on the containment structure shall retain air borne particles but may allow air flow through the containment materials. Flexible materials shall be supported and fastened to prevent escape of abrasive and blast materials due to whipping from traffic or wind and to maintain the clearances.

All mating joints between the ventilated containment structure and the bridge shall be sealed. Sealing may be by overlapping of seams when using flexible materials or by using tape, caulking, or other sealing measures.

Multiple flap overlapping door tarps shall be used at entry ways to the ventilated containment structure to prevent dust or debris from escaping.

Baffles, louvers, flapper seals or ducts shall be used at make-up air entry points to the ventilated containment structure to prevent escape of abrasives and resulting surface preparation debris.

The ventilated containment structure shall be properly maintained while work is in progress and shall not be changed from the approved working drawings without prior approval of the Engineer.

The ventilation system in the ventilated containment structure shall be of the forced input air flow type with fans or blowers.

Negative air pressure shall be employed within the ventilated containment structure and will be verified by visual methods by observing the concave nature of the containment materials while taking into account wind effects, or by using smoke or other visible means to observe air flow. The input air flow shall be properly balanced with the exhaust capacity throughout the range of operations.

The exhaust air flow of the ventilation system in the ventilated containment structure shall be forced into dust collectors (wet or dry) or bag houses.

PROTECTIVE WORK CLOTHING AND HYGIENE FACILITIES.--Wherever there is exposure or possible exposure to heavy metals or silica dust at the bridge site, the Contractor shall, for not more than 3 State personnel: (1) furnish, clean and replace protective work clothing and (2) provide access to hygiene facilities. The furnishing, cleaning and replacement of protective work clothing, and hygiene facilities shall conform to the provisions of subsections (g), "Protective work clothing and equipment," and (i), "Hygiene facilities and practices," of Section 1532.1, "Lead," of the Construction Safety Orders.

The protective work clothing and access to hygiene facilities shall be provided during exposure or possible exposure to heavy metals or silica dust at the bridge site and application of the undercoats of paint.

Protective work clothing and hygiene facilities shall be inspected and approved by the Engineer before being used by State personnel.

The protective work clothing shall remain the property of the Contractor at the completion of the contract.

PAYMENT.--Full compensation for the containment system, protective work clothing and access to hygiene facilities for State personnel; and handling of debris produced when the existing paint system is disturbed, including testing, hauling, treatment, disposal fees and local taxes, shall be considered as included in the contract price paid for the item of work requiring the disposal of the debris produced when the existing paint system is disturbed and no additional compensation will be allowed therefor.

Work area monitoring will be paid for on the basis of a lump sum price.

The contract lump sum price paid for work area monitoring shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in collecting and analyzing of samples of ambient air and soil for heavy metals, complete in place, including reporting the test results, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.13A ABANDON CULVERTS AND PIPE LINES

Existing culverts and utility pipe lines, where shown on the plans to be abandoned, shall be abandoned in place or at the option of the Contractor, the culverts and pipe lines shall be removed and disposed of. All resulting openings into existing structures, that are to remain in place, shall be plugged with commercial quality concrete containing not less than 470 pounds of cement per cubic yard.

Abandoning culverts and pipe lines in place shall conform to the following:

Culverts and pipe lines, that intersect the side slopes, shall be removed to a depth of not less than 3 feet, measured normal to the plane of the finished side slope, before being abandoned.

The ends of culverts and pipe lines shall be securely closed by a 0.5-foot thick tight fitting plug or wall of commercial quality concrete.

Culverts and pipe lines shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended culvert or pipe abandonment.

Full compensation for plugs, culvert and pipe removal, structure excavation, and backfill shall be considered as included in the contract unit price paid for abandon culvert and contract price paid per linear foot for abandon pipe line, and no additional compensation will be allowed therefor.

10-1.13B ABANDON VAULT

Existing vaults where shown on the plans to be abandoned, shall be abandoned.

The contract unit price paid for abandon vault shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in abandoning vaults, complete in place, including structure excavation, and backfill, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.13C REMOVE CRASH CUSHION AND CRASH CUSHION PANELS AND CELLS

Existing standard hi-dro crash cushion, crash cushion panels and cells, where shown on the plans to be removed, shall be removed and disposed of.

The contract unit price paid for remove standard hi-dro crash cushion and the contract price paid per linear foot for remove crash cushion panels and cells shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in removing the crash cushions, panels and cells, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.13D REMOVE PAVEMENT MARKERS

Existing pavement markers, when no longer required for traffic lane delineation as directed by the Engineer, shall be removed and disposed of.

10-1.13E REMOVE PAINTED AND THERMOPLASTIC TRAFFIC STRIPES

Painted and thermoplastic traffic stripes to be removed will be designated by the Engineer.

Where blast cleaning is used for the removal of painted traffic stripes or for removal of objectionable material, and such removal operation is being performed within 10 feet of a lane occupied by public traffic, the residue including dust shall be removed immediately after contact between the sand and the surface being treated. Such removal shall be by a vacuum attachment operating concurrently with the blast cleaning operation.

Nothing in these special provisions shall relieve the Contractor from his responsibilities as provided in Section 7-1.09, "Public Safety," of the Standard Specifications.

10-1.13F REMOVE DRAINAGE FACILITIES

Existing inlets and pipe, where shown on the plans to be removed, shall be completely removed and disposed of.

10-1.13G RESET ROADSIDE SIGNS

Existing roadside signs shall be removed and reset as shown on the plans.

10-1.13H REMOVE PORTLAND CEMENT CONCRETE PAVEMENT

Removing portland cement concrete pavement shall conform to the provisions in Section 15-3, "Removing Concrete," of the Standard Specifications.

Where no joint exists in the pavement on the line at which concrete is to be removed, a straight, neat cut with a power driven saw shall be made along said line to a minimum depth of 0.17-foot before removing concrete.

The quantities of portland cement concrete pavement removed will be measured and paid for by the square yard.

No deduction will be made from any excavation quantities for the quantity of portland cement concrete pavement removed.

Full compensation for removing bituminous or other overlying material and sawing joints at removal lines, as required, shall be considered as included in the contract price paid per square yard for remove concrete pavement and no additional compensation will be allowed therefor.

10-1.13I BRIDGE REMOVAL

Removing portions of bridge shall conform to the requirements in Section 15-4, "Bridge Removal," of the Standard Specifications and these special provisions.

Bridge removal (portion) shall consist of removing portions of the West Viaduct of the San Francisco-Oakland Bay Bridge (Bridge No. 34-0004) at Yerba Buena Island including removing walls or portions of walls designated on the plans to be removed.

All affected areas of existing steel within 4 inches of the point of application of heat for flame cutting used in bridge removal shall be dry spot blast cleaned prior to heating and the cleaned steel remaining after said bridge removal shall be painted as specified in "Clean and Paint Structural Steel," of these specifications. Full compensation for cleaning and painting said areas shall be considered as included in the contract lump sum price paid for bridge removal (portion) and no separate payment will be allowed therefor.

All removed materials that are not to be salvaged or used in the reconstruction shall become the property of the Contractor and shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

The following additional requirements apply to the removal of portions of bridges whenever the removal work is to be performed over traffic:

A protective cover supported by falsework, temporary supports, or members of the existing structure shall be constructed before beginning bridge removal work.

The construction and removal of the protective cover and the installation and removal of temporary railings shall conform to the requirements under "Public Safety", "Order of Work", "Maintaining Traffic" and "Temporary Railings" of these special provisions.

The protective cover shall prevent any materials, equipment or debris from falling onto the traffic. The protective cover shall have a minimum strength equivalent to that provided by good, sound Douglas fir planking having a nominal thickness of 2 inches. Additional layers of material shall be furnished as necessary to prevent fine materials or debris from sifting down upon the traveled way and shoulders.

The protective cover shall conform to the provisions for falsework in Section 51-1.06, "Falsework," of the Standard Specifications.

The Contractor shall be responsible for designing and constructing a safe and adequate protective cover, and shoring and falsework needed to support the protective cover, all with sufficient strength and rigidity to support the entire load to be imposed.

Bridge removal methods shall be described in the working drawings and calculations in sufficient detail to substantiate live loads used in the protective cover design. Dead and live load values assumed for designing the protective cover shall be shown on the working drawings.

At locations where concrete above traveled ways is removed the protective cover shall extend 4 feet beyond concrete removal limits.

During the removal of bridge segments, and when portions of the bridge, such as deck slabs or box girder slabs, comply with the requirements for the protective cover, a separate protective cover need not be constructed.

Before removal, the protective cover shall be cleaned of all debris and fine material.

The protective cover shall provide the openings specified under "Maintaining Traffic" of these special provisions, except that when no openings are specified for bridge removal a vertical opening of 15 feet shall be provided for the passage of public traffic.

The construction of the protective cover as herein specified shall in no way be construed to relieve the Contractor of his responsibility as specified in Section 7-1.12, "Responsibility for Damage," of the Standard Specifications.

10-1.13J TEMPORARY SUPPORTS

Temporary supports for existing structures during bridge removal, reconstruction and retrofit work shall be designed, furnished, constructed, monitored, maintained and removed as shown on the plans and in accordance with the requirements of these special provisions.

Temporary supports shall include jacking assemblies and appurtenant items necessary to jack and support the structures.

Attention is directed to the sections, "Order of Work," and "Maintaining Traffic," of these special provisions regarding the construction sequences.

Temporary supports shall not encroach upon traveled way.

TEMPORARY SUPPORT DESIGN AND DRAWINGS.--The Contractor shall submit to the Engineer working drawings and design calculations for the temporary supports including all features necessary to remove portions of the bridge in a safe and controlled manner. Such drawings and design calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California. The temporary support working drawings and design calculations shall conform to the requirements in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. The number of sets of drawings and design calculations and times for review for temporary supports shall be the same as specified for falsework working drawings in Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications.

Working drawings for any part of the temporary supports shall include stress sheets, anchor bolt layouts, shop details, erection and removal plans.

The temporary support working drawings shall include descriptions and values of all loads, including construction equipment loads, descriptions of equipment to be used, complete details and calculations for jacking and supporting the existing structure, including procedure for jacking the structure should settlement occur, and descriptions of the displacement monitoring system. The displacement monitoring system shall include equipment to be used, location of control points, method and schedule of taking measurements.

A redundant system of supports shall be provided during the entire jacking operation for backup should any of the jacks fail. The redundant system shall include stacks of steel plates added as necessary to maintain the redundant supports at each jack location within 1/4 inch of the jacking sill or corbels.

When footing type foundations are to be used, the Contractor shall determine the bearing value of the soil and shall show the values assumed in the design of the temporary supports on the temporary support drawings. Anticipated temporary support foundation settlement shall be shown on the temporary support drawings.

When pile type foundations are to be used, the temporary support drawings shall show the maximum horizontal distance that the top of a temporary support pile may be pulled in order to position it under its cap. The temporary support plans shall also show the maximum allowed deviation of the top of the pile, in its final position, from a vertical line through the point of fixity of the pile.

Temporary support footings shall be designed to carry the load imposed upon them without exceeding the estimated soil bearing values and anticipated settlements.

After concrete in a column has reached its 28-day compressive strength, the Contractor may use the retrofitted column as part of the temporary support.

Where temporary supports are supported on the deck of an existing structure then temporary supports shall conform to the following:

Temporary supports shall bear directly on girder stems or bent caps or shall bear on support sills which are structurally adequate to transmit the load to the stems or cap without over stressing any member of the new or existing structure. Temporary supports shall not induce permanent forces into the completed structure or produce cracking.

Temporary supports shall be in place beneath the existing structure where temporary support loads are imposed upon the existing structure. Such temporary supports shall be designed and constructed to support all loads imposed upon the existing structure from the upper structure and any other loads imposed as a result of the proposed construction operations.

Bracing shall be provided, as necessary, to withstand all imposed loads during erection and removal of any temporary supports. The temporary support drawings shall show provisions for such temporary bracing or methods to be used to conform to these requirements during each phase of erection and removal. Wind loads shall be included in the design of such bracing or methods. Wind loads shall conform to the applicable paragraphs in Section 51-1.06A(1), "Design Loads," of the Standard Specifications.

The assumed horizontal load to be resisted by the temporary supports shall be the sum of the actual horizontal loads due to equipment, construction sequence or other causes and an allowance for wind, but in no case shall the assumed horizontal load to be resisted in any direction be less than 10 percent of the total dead load of the structure to be supported.

The temporary support design calculations shall show a summary of computed stresses in the (1) temporary supports, (2) connections between temporary supports and the existing structure and (3) existing load supporting members. The computed stresses shall include the effect of the jacking sequence. The temporary support design calculations shall also include a lateral stiffness assessment of the temporary support system and conform to the design values shown on the plans.

Allowable stresses shall be no greater than those described in Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications.

If falsework loads are imposed on temporary supports, the temporary supports shall also satisfy the deflection criteria described in Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications.

TEMPORARY SUPPORT DESIGN CRITERIA.--The temporary supports shall support the initial jacking loads and the minimum temporary support design loads shown on the plans. The vertical design loads shall be adjusted for the weight of temporary supports and jacks, construction equipment loads and additional loads imposed by the Contractor's operations. The construction equipment loads shall be the actual weight of the construction equipment but in no case shall be less than 20 pounds per square foot of deck surface area of the frame involved. A frame is defined as the portion of the bridge between expansion joints.

The temporary supports shall resist the specified lateral design forces applied at the point where the column to be removed meets the superstructure. Lateral stiffeners shall be provided. The maximum allowable column drift shall be 5 percent. Column drift shall be defined as the ratio of the allowable displacement to the clear height of the column. Said clear height shall be defined as the distance between the bottom of the soffit and the top of the footing. The lateral design forces to be resisted shall be increased to be compatible with the temporary support lateral stiffness if the stiffness exceeds the specified minimum. The temporary supports resisting longitudinal lateral loads shall be placed within the frame having column(s) removed.

The existing structure shall be mechanically connected to the temporary supports. The temporary supports shall be mechanically connected to their foundations. The mechanical connections shall be capable of resisting the lateral temporary support design forces. Friction forces developed between the existing structure and temporary supports shall not be used to reduce the lateral forces and shall not be considered as an effective mechanical connection. The mechanical connections shall be designed to tolerate adjustments to the temporary support frame throughout the use of the temporary supports.

If the concrete is to be prestressed, the temporary supports shall be designed to support any increased or readjusted loads caused by the prestressing forces.

MANUFACTURED ASSEMBLIES.--Manufactured assemblies shall conform to the provisions in Section 51-1.06A(2), of the Standard Specifications and these special provisions.

Each jack shall be equipped with either a pressure gage or a load cell for determining the jacking force. Pressure gages shall have an accurately reading dial at least 6-inches in diameter. Each jack shall be calibrated by a private laboratory approved by the Transportation Laboratory within 6 months prior to use and after each repair, unless otherwise directed. Each jack and its gage shall be calibrated as a unit with the cylinder extension in the approximate position that it will be at final jacking force and shall be accompanied by a certified calibration chart. Load cells shall be calibrated and provided with an indicator by which the jacking force is determined.

SPECIAL LOCATIONS.--Temporary supports shall conform to the provisions for falsework in Section 51-1.06A(3), "Special Locations," of the Standard Specifications.

TEMPORARY SUPPORT CONSTRUCTION.-- Temporary support construction shall conform to the provisions for falsework construction in Section 51-1.06B, "Falsework Construction," of the Standard Specifications.

Welding, welder qualification, and inspection of welding for all steel members shall conform to the requirements of ANSI/AASHTO/AWS D1.5.

Prior to proceeding with bridge removal, an engineer for the Contractor who is registered as a Civil Engineer in the State of California shall inspect the temporary supports, including jacking and displacement monitoring systems,

for conformity with the working drawings. The Contractor's registered engineer shall certify in writing that the temporary supports, including jacking and displacement monitoring systems, substantially conform to the working drawings, and that the material and workmanship are satisfactory for the purpose intended. A copy of this certification shall be available at the site of the work at all times.

The Contractor's registered engineer shall be present at the bridge site at all times when jacking operations or adjustments are in progress and when bridge removal operations are in progress. The Contractor's registered engineer shall inspect the jacking and removal operation and report in writing on a daily basis the progress of the operation and the status of the remaining structure. A copy of the daily report shall be available at the site of the work at all times. Should an unplanned event occur, the Contractor's registered engineer shall submit immediately to the Engineer for approval, the procedure or proposed operation to correct or remedy the occurrence.

The Contractor shall perform an initial survey as part of the displacement monitoring system to record the location of the existing structure prior to the commencement of any work. Two copies of the survey shall be signed by an engineer, who is registered as a Civil Engineer in the State of California, and submitted to the Engineer.

Vandal-resistant displacement monitoring equipment shall be provided and maintained. Vertical and horizontal displacements of the temporary supports and the existing structure shall be monitored continuously during jacking operations and shall be accurately measured and recorded at least weekly during removal and reconstruction work. As a minimum, elevations shall be taken prior to the start of jacking operations, immediately after jacking is complete, after bridge removal is complete, before connecting the retrofitted superstructure to the substructure, and after the temporary supports have been removed. As a minimum, the existing structure shall be monitored at the bent and at mid span of both adjoining spans. Control points at each location shall be located near the center and at both edges of the superstructure. The records of vertical and horizontal displacement shall be signed by an engineer who is registered as a Civil Engineer in the State of California and available to the Engineer at the jobsite during normal working hours, and a copy of the record shall be delivered to the Engineer at the completion of reconstructing each bent.

A force equal to the initial jacking load or the dead load shown on the plans shall be applied to the structure by the temporary support system and held until all initial compression and settlement of the system is completed before bridge removal work at the location being supported is begun.

Jacking operations shall be carefully controlled and monitored to ensure that the jacking loads are applied simultaneously to prevent distortion and excessive stresses that would damage the structure. The superstructure shall be jacked as necessary to maintain the total vertical displacements at control points to less than 1/4 inch from the elevations recorded prior to jacking or as modified by the Engineer.

Should unanticipated displacements, cracking or other damage occur, the construction shall be discontinued until corrective measures satisfactory to the Engineer are performed. Damage to the structure as a result of the Contractor's operations shall be repaired by the Contractor according to the requirements in Section 7-1.11, "Preservation of Property," of the Standard Specifications.

Following completion of the reconstruction, the monitored control points shall not deviate from the vertical position by more than 1/4 inch from the initial survey elevations or the elevations as modified by the Engineer.

REMOVING TEMPORARY SUPPORTS.--Removing temporary supports shall conform to the provisions for removing falsework in Section 51-1.06C, "Removing Falsework," of the Standard Specifications.

No temporary supports shall be released until the supported concrete has attained 100 percent of the specified strength.

Attachments shall be removed from the existing structure and concrete surfaces restored to original conditions, except where permanent alterations are shown on the plans.

PAYMENT.--The contract lump sum price paid for temporary supports shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in designing, constructing, maintaining, and removing the temporary supports, including jacking the existing structure and monitoring displacements, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.13K TEMPORARY DECK BRIDGING

Temporary deck bridging for bridging deck gaps during deck reconstruction work shall be designed, constructed, monitored, maintained and removed as specified in these special provisions.

Attention is directed to "Maintaining Traffic," of these special provisions.

TEMPORARY DECK BRIDGING DESIGN AND WORKING DRAWINGS.--The Contractor shall submit to the Engineer working drawings and design calculations for the temporary deck bridging. Such drawings and

design calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California. Five sets of the drawings and one copy of the design calculations shall be furnished.

The temporary deck bridging working drawings shall conform to the requirements in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications. Working drawings for any part of the temporary deck bridging shall include, but not be limited to stress sheets, connection details, modifications to existing bridge members, shop details, erection and removal plans, and equipment lists.

The working drawings shall include descriptions and values of all loads, including construction equipment and vehicular live loads, descriptions of equipment to be used, and complete details and calculations for supporting all loads imposed.

The Contractor shall allow four weeks for the review of any temporary deck bridging working drawings after complete drawings, calculations and all support data have been submitted to the Engineer .

Should the Engineer fail to complete the review within the time allowed and if, in the opinion of the Engineer, the Contractor's controlling operation is delayed or interfered with by reason of the delay in temporary deck bridging working drawing review, the delay will be considered a right of way delay as specified in Section 8-1.09, "Right of Way Delays," of the Standard Specifications.

The temporary deck bridging shall be mechanically connected to the existing structure while subjected to vehicular loads and shall not over stress, induce permanent forces into or produce cracking in the existing structure.

The temporary deck bridging shall support vehicular live loads, dead loads, construction equipment loads and additional loads imposed by the Contractor's operations. The construction equipment loads shall be the actual weight of the construction equipment.

As a minimum, the vehicular loading for the temporary deck bridging shall be designed to support the greater of AASHTO HS20-44 loading with 100 percent impact or AASHTO Permit loading with 100 percent impact.

The temporary deck bridging shall have a uniform surface texture that provides a coefficient of friction of not less than 0.35.

Manufactured assemblies shall conform to the provisions in Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications and these special provisions.

TEMPORARY DECK BRIDGING CONSTRUCTION.--Temporary deck bridging construction shall conform to the requirements for falsework in the first paragraph of Section 51-1.06B, "Falsework Construction," of the Standard Specifications.

Welding, welder qualification, and inspection of welding shall conform to the requirements of ANSI/AASHTO/AWS D1.5.

At least 5 days prior to removing portions of the deck, the Contractor shall provide the temporary deck bridging components at a location within 30 minutes of the jobsite.

Where deck concrete is removed and the Contractor is unable, as determined by the Engineer, to construct the new deck, including curing concrete, by the time the affected portion of the deck is to be opened to traffic, the gap created shall be bridged with the temporary deck bridging.

Should unanticipated displacements, cracking or other damage occur to the existing structure or to any new components installed at the joint, the construction shall be discontinued until corrective measures satisfactory to the Engineer are performed. Damage to the structure as a result of the Contractor's operations shall be repaired by the Contractor according to the requirements in Section 7-1.11, "Preservation of Property," of the Standard Specifications.

The temporary deck bridging surface shall not vary more than 1/4 inch vertically or 1/2 inch horizontally from the existing adjacent deck surface.

When not in use, the temporary deck bridging components shall be stored at a location within 30 minutes of the jobsite at all times during deck reconstruction work.

When temporary deck bridging is no longer needed to bridge the gap, all temporary deck bridging and connections shall be removed from the existing structure, and the concrete surfaces beyond the limits of removal shown on the plans shall be restored to their original condition.

PAYMENT.--The contract lump sum price paid for temporary deck bridging shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in furnishing, attaching, maintaining and removing temporary deck bridging, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.13L REMOVE CONCRETE

Concrete, designated on the plans to be removed, shall be removed.

The pay quantities of concrete to be removed, except concrete barrier, will be measured by the cubic yard, measured before and during removal operations. Remove concrete barrier will be measured and paid for by the linear foot.

Concrete removed shall be disposed of outside the highway right of way in accordance with the provisions in Section 7-1.13 of the Standard Specifications.

Where no joint exists between concrete to be removed and concrete to remain in place, the concrete shall be cut in a neat line to a minimum depth of 0.17-foot with a power driven saw before concrete is removed.

Concrete to be removed which has portions of the same structure both above and below ground will be considered as concrete above ground for compensation.

10-1.13M MODIFY WATER AND AIR LINES (BRIDGE)

Modify water and air lines shall consist of modifying water lines, air lines and related equipment. Water and air lines shall be of the size shown and shall conform to the details shown on the plans, the provisions in Section 20-5, "Irrigation Systems," of the Standard Specifications and these special provisions.

Working drawings.--The Contractor shall submit complete working drawings to the Office of Structure Design, Documents Unit, P.O. Box 942874, Sacramento, CA 94274-0001 (1801 30th Street, Sacramento, CA 95816), telephone (916) 227-8230, in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," of the Standard Specifications.

The working drawings shall show the temporary support of the water and air lines and shall be supplemented by manufacturer's descriptive data, performance data and installation instructions for the following:

- Pipe hanger assembly and lateral restraint assembly
- Mechanical couplings
- Pipe and fittings
- Pipe grooving procedure

For initial review, 5 sets of drawings shall be submitted. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to the said Office for final approval and use during construction.

MATERIALS:--

Pipe and fittings for air and water lines 4-inch diameter or greater.--Pipes and fittings for water lines of 4-inch diameter or greater shall be grooved end standard weight galvanized steel pipe conforming to ASTM Designation: A 53 or A 120. The weight of the zinc coating shall be not less than 90 percent of that specified in ASTM Designation: A 53. Pipe grooves shall conform to AWWA Designation: C606.

Fittings shall be premanufactured grooved end. Fittings shall be malleable iron, hot dip galvanized according to ASTM Designation: A153.

Pipe and fittings for air and water lines less than 4-inch diameter.--Pipe and fittings for air line less than 4-inch diameter shall be schedule 40 galvanized steel pipe conforming to ASTM Designation: A 53 or A 120, with 150-pound galvanized malleable iron banded screwed fittings and galvanized steel couplings. The weight of the zinc coating shall be not less than 90 percent of that specified in ASTM Designation: A 53.

Mechanical couplings.--Mechanical couplings shall be suitable for grooved pipe, two piece, ductile iron housing with manufacturer's standard grade enamel paint coating, Type 304 Stainless steel hardware, and a synthetic rubber gasket designed for potable water located around the pipe ends inside the housings. Coupling shall be rated for 800 psi for pipe couplings and 250 psi for pipe to flange couplings.

Thrust blocks.--Concrete thrust blocks shall be installed at all changes of direction on underground air and water lines. The thrust blocks shall be sized and installed as per IAPMO IS 8-92 (Located in the 1994 Uniform Plumbing Code).

Structural Steel.--Miscellaneous structural steel, including plate, angle iron, and threaded rod shall conform to the provisions in Section 55, "Steel Structures," of the Standard Specifications. Miscellaneous nuts, bolts and related hardware shall be hot dip galvanized, ASTM Designation: A 325.

Jacking.--Jacking pipe as shown on the plans shall conform to Section 66-8.10 of the Standard Specifications except that Galvanized pipe shall be used and field welding shall not be allowed.

INSTALLATION:--Water and air lines on bridge structures shall be supported as shown on the plans and in conformance with these special provisions.

Prior to depressurizing existing water and air lines, the Contractor shall install and test all new pipe up to the points of connection to existing water and air main lines. The Contractor shall have all necessary men, materials and equipment at the site as needed to proceed with the work to make the final connections in an expeditious manner. The existing air and water lines shall be depressurized for a period not to exceed 24 hours.

The Contractor shall contact the Administrative Officer of the San Francisco Fire Department at (415) 558-3406 for San Francisco Fire Department personnel and equipment to be on standby for the period not to exceed 24 hours when existing water and air lines are depressurized.

The Contractor shall notify the Administrative Officer of the San Francisco Fire Department in writing at least 10 days in advance of the date services are required. Written notification shall be sent to the Administrative Officer, Room 225, 260 Golden Gate Avenue, San Francisco, CA 94102.

The Contractor shall make payment of \$3,815 to the San Francisco Fire Department within 5 days after services are provided by the San Francisco Fire Department.

The Contractor shall have access readily available for the San Francisco Fire Department on the job site so that the San Francisco Fire Department can easily respond to any incident on the bridge or in the tunnel.

Relocating equipment.--Equipment to be relocated shall be removed, cleaned and inspected. Any damage to the equipment shall be reported to the Engineer. The equipment shall be installed as shown on the plans and to match the existing installation. After installation, the equipment shall be tested to insure proper operation. The proper operation of the equipment shall be demonstrated to the Engineer.

Cleaning and closing of pipe.--The interior of all pipe shall be cleaned before installation. All openings shall be capped or plugged as soon as the pipe is installed to prevent the entrance of any materials. The caps or plugs shall remain in place until their removal is necessary for completion of the installation.

TESTING.--Water and air lines less than 12-inch diameter shall be tested in accordance with the provisions in Section 20-5.03H(1), "Method A," of the Standard Specifications, except that the initial testing period shall be 4 hours minimum with no leakage or pressure drop.

The Contractor shall furnish pipe anchorage to resist thrust forces occurring during testing. All leaks shall be repaired and all defective materials shall be replaced by the Contractor at his expense.

Branch lines shall be tested individually or with the main lines.

MEASUREMENT AND PAYMENT.--The contract lump sum price paid for modify water and air lines (bridge) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in furnishing and installing modify water and air lines (bridge), complete in place, including furnishing and installing pipe, pipe supports, steel hangers and other fittings, concrete supports, pipe jacking, relocating equipment, testing, and checking, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Standby assistance by the San Francisco Fire Department will be paid for as extra work as provided in Section 4-1.03D, "Extra Work," of the Standard Specifications.

10-1.14 CLEARING AND GRUBBING

Clearing and grubbing shall conform to the provisions in Section 16, "Clearing and Grubbing," of the Standard Specifications and these special provisions.

Vegetation shall be cleared and grubbed only within the excavation and embankment slope lines.

At locations where there is no grading adjacent to a bridge or other structure, clearing and grubbing of vegetation shall be limited to 5 feet outside the physical limits of the bridge or structure.

Existing vegetation, outside the areas to be cleared and grubbed, shall be protected from injury or damage resulting from the Contractor's operations.

Activities controlled by the Contractor, except cleanup or other required work, shall be confined within the graded areas of the roadway.

Nothing herein shall be construed as relieving the Contractor of Contractor's responsibility for final cleanup of the highway as provided in Section 4-1.02, "Final Cleaning Up," of the Standard Specifications.

10-1.15 EARTHWORK

Earthwork shall conform to the provisions in Section 19, "Earthwork," of the Standard Specifications and these special provisions.

CONTAMINATED AND HAZARDOUS MATERIAL EXCAVATION.--All contaminated and hazardous material excavated as shown on the plans shall be transported to a disposal facility permitted to accept such material. All surplus contaminated material excavated as shown on the plans shall be transported to a disposal facility permitted to accept such material.

Attention is directed to "Contaminated and Hazardous Material, General" elsewhere in these special provisions.

Attention is directed to the plans for a summary of the vertical extent, degree, and type of contamination in the areas to be excavated.

Upon completion of hazardous material excavation, personal protective equipment, when no longer required, as determined by the Engineer, shall be removed from the job site.

MEASUREMENT AND PAYMENT.--Full compensation for loading, transporting, and disposing of contaminated and hazardous material shall be considered as included in the contract price paid per cubic yard for structure excavation (Type H) and lump sum price paid for seismic retrofit (electrical facilities) and no additional compensation will be allowed therefor.

If structure excavation or structure backfill involved in bridges is not otherwise designated by type, and payment for such structure excavation or structure backfill has not otherwise been provided for in the Standard Specifications or these special provisions, such structure excavation or structure backfill will be paid for at the contract price per cubic yard for structure excavation (bridge) or structure backfill (bridge).

10-1.16 ASPHALT CONCRETE

Asphalt concrete shall be produced at an established commercial mixing plant. The aggregate and asphalt binder shall be heated and mixed thoroughly.

The maximum size aggregate shall be 1/2 inch.

Prior to spreading asphalt concrete, a paint binder of asphaltic emulsion or of paving asphalt shall be furnished and applied uniformly to a pavement to be surfaced and to contact surfaces of all cold pavement joints, curbs, gutters and to other surfaces designated by the Engineer. If paving asphalt is furnished it shall be applied at a temperature of not less than 285° F. nor more than 350° F.

Asphalt concrete shall be spread and compacted by methods that will produce an asphalt concrete surfacing true to grade and cross section, of uniform smoothness and texture, compacted firmly and free from depressions, humps or irregularities.

Compensation for the work performed under this section "Asphalt Concrete" shall conform to the provisions in Section 39-8.01, "Measurement," and Section 39-8.02, "Payment," of the Standard Specifications.

10-1.17 CONCRETE PAVEMENT

Portland cement concrete pavement shall conform to the provisions in Section 40, "Portland Cement Concrete Pavement," of the Standard Specifications and these special provisions.

The concrete for pavement shall contain a minimum of 658 pounds of portland cement per cubic yard.

An air-entraining admixture conforming to the requirements in Section 90-4, "Admixtures," of the Standard Specifications shall be added to the concrete at the rate required to result in an air content of 6 (±1 1/2) percent in the freshly mixed concrete.

10-1.18 MINOR CONCRETE (PIPE COVER)

Concrete for minor concrete (pipe cover) shall conform to the provisions in Section 90-10, "Minor Concrete," of the Standard Specifications and these special provisions

Minor concrete shall contain not less than 658 pounds of cement per cubic yard.

Calcium chloride conforming to the provisions of Section 90-4.04 of the Standard Specifications shall be added to the minor concrete (pipe cover).

The concrete shall be placed in the trench against undisturbed material at the sides of the trench. Foreign material which falls into the trench, prior to or during placing of the concrete, shall be immediately removed. Where necessary, earth plugs shall be constructed and compacted at the ends of the planned concrete to contain the concrete within the trench.

The surface of the minor concrete (pipe cover) shall be broomed with a heavy broom to produce a uniform rough surface.

Minor concrete (pipe cover) shall be placed and compacted without segregation and the finished surface shall not vary more than 0.05-foot above or below the grade established by the Engineer.

Minor concrete (pipe cover) shall be cured by applying SS1 type asphaltic emulsion applied in conformance with the provisions in Section 94, "Asphaltic Emulsions," of the Standard Specifications. The curing seal shall be applied at a rate between 0.15- and 0.25-gallon per square yard of surface. The exact rate of application will be determined by the

Engineer. Any areas of the curing seal that are damaged shall be covered immediately with additional seal by the Contractor at his expense. The curing seal shall be allowed to remain on the minor concrete (pipe cover) to serve as a paint binder when surfacing is placed thereon.

Minor concrete (pipe cover) will be measured and paid for by the cubic yard in the same manner specified for minor concrete (backfill) in Section 65-1.10, "Payment," of the Standard Specifications.

Full compensation for curing seal and calcium chloride shall be considered as included in the contract price paid per cubic yard for minor concrete (pipe cover) and no separate payment will be made therefor.

10-1.19 TIEDOWN ANCHORS

Tiedown anchors in bridge footings; consisting of steel bar or strand tendons with anchorage assemblies that are grouted in cored, formed and drilled holes; shall conform to the provisions of Section 50, "Prestressing Concrete," of the Standard Specifications, these special provisions and the details shown on the plans.

Whenever "member" is referred to in Section 50, "Prestressing Concrete," of the Standard Specifications, it shall be considered to mean tiedown anchor.

Foundation recommendations are included in the "Materials Information" available to the Contractor as provided for in Section 2-1.03, "Examination of Plans, Specifications, Contract, and Site of Work," of the Standard Specifications.

Rock cores are available for viewing at Caltrans Transportation Lab, 5900 Folsom Boulevard, Sacramento, California, Telephone (916) 227-7000.

Difficult tiedown installation is anticipated due to the presence of fractured rock, low overhead clearance, the requirements of tiedown embedment into rock, and traffic control.

The Contractor shall determine the bond length necessary to meet acceptance criteria specified herein.

The submittal of microfilms will not be required for tiedown anchor installations.

Alternative details for the anchorage enclosure device may be submitted to the Engineer for approval if necessary to accommodate the anchorage assembly being used.

MATERIALS.--When calculating the minimum cross sectional area of steel bars or strands, the ultimate strength, f_{pu} , of 150 kips per square inch for prestressing steel shall be used.

The steel tube and bearing plate of the anchorage assembly and the anchorage enclosure assembly shall conform to the provisions of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications. The steel tube and bearing plate and the anchorage enclosure shall be galvanized after fabrication.

The permanent bearing plate of the tiedown anchor shall effectively distribute the design force (T), uniformly to the top of the footing. The size of and thickness of the bearing plate shall be such that the footing concrete bearing stress does not exceed 2400 pounds per square inch and the bending stress does not exceed 0.9 fy for steel.

Grout shall conform to the provisions in Section 50-1.09, "Bonding and Grouting," of the Standard Specifications. The grout will not be required to pass through a screen with a 0.07-inch maximum clear opening prior to being introduced into the grout pump. Fine aggregate may be added to the grout mixture of Portland cement and water outside of the grouted sheathing in drilled holes that are 8 inches or greater in diameter, but only to the extent that the cement content of the grout is not less than 846 pounds per cubic yard of grout. Fine aggregate, if used, shall conform to the provisions in Section 90-2, "Materials," and Section 90-3, "Aggregate Gradings," of the Standard Specifications.

When a bond breaker is shown on the plans near the bearing plate, the bond breaker shall be a 1/4" premolded joint filler conforming to the provisions in Section 51-1.12C, "Premolded Expansion Joint Fillers," of the Standard Specifications.

Smooth and corrugated plastic sheathing, including joints, shall be watertight. Polyvinyl chloride (PVC) sheathing shall conform to ASTM Designation: D 1784, Class 13464-B. High density polyethylene (HDPE) sheathing shall have a density between 0.940- and 0.960-gram/cm³ as measured in accordance with ASTM Designation: D 792, A-2. Corrugated plastic sheathing shall be PVC or HDPE.

The transition between the corrugated plastic sheathing and the anchorage assembly shall be an approved detail that allows stressing to the design force without evidence of distress in the corrugated plastic sheathing.

Additional requirements for tiedowns with bar type tendons are as follows:

Corrugated sheathing for bar tendons shall have a nominal wall thickness of 40 mils.

Additional requirements for tiedowns with strand type tendons are as follows:

Corrugated HDPE sheathing for strands shall have a nominal wall thickness of 60 mils. Corrugated PVC sheathing for strands shall have a nominal wall thickness of 40 mils.

The individual strands of a tendon, except for the bonded length, shall be fully coated with corrosion inhibiting grease and then encapsulated by a smooth polypropylene or HDPE sheath. Polypropylene sheathing shall have a

density between 0.900 g/cm³ and 0.910 g/cm³. The minimum sheath wall thickness shall be 40 mils. The corrosion inhibiting grease shall fill all space between strand wires and shall encapsulate the strand giving an encasement diameter at least 5 mils greater than the diameter of the bare strand. The sheath shall be hot melt extruded onto the strand or shall be shop applied by an approved method that assures that all spaces between the sheath and the strand and between the strand wires are filled with corrosion inhibiting grease.

The corrosion inhibiting grease shall provide a continuous non brittle film of corrosion protection to the prestressing steel and lubrication between the strand and the sheathing, shall resist flow from the sheathing, shall be chemically stable and non reactive with the prestressing steel, sheathing material and concrete, and shall be organic with appropriate polar, moisture displacing, and corrosion inhibiting additives.

The corrosion inhibiting grease shall have the physical properties listed in Table 3.2.1 of the Post Tensioning Manual, Fourth Edition, by the Post Tensioning Institute and as modified below. At least 40 days before use, a sample from the lot to be used and test results shall be provided for the corrosion inhibiting grease.

Test	Requirements	ASTM Designation:
Water Soluble Ions: Nitrates	10 pm max.	D 3867
Corrosion Test: 5% Salt Fog @ 100° F. 5 mils coating on 3"x6" Q panel Type S, 1000 hrs. min.	Grade 7 or better	B 117, D 610
Compatibility with sheathing: Hardness change & volume change of polymer after exposure to grease 40 days at 150° F.	15% max. 10% max.	D 4289, Except use D 792 for density

CONSTRUCTION.--Tiedown anchors shall be installed in accordance with the manufacturer's recommendations. In case of a conflict between the manufacturer's recommendations and these special provisions, these special provisions shall prevail.

Water and grout from tiedown anchor construction operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into landscaping, gutters or other drainage facilities. Excessive amounts of water shall not be used in any of the drilling and the tiedown anchor installation procedures.

The holes drilled in the foundation materials shall be drilled to a depth sufficient to provide the necessary bond length beyond the minimum unbonded length shown on the plans. The diameter of the hole shall be large enough to provide a minimum of one inch grout cover over the corrugated plastic sheathing for the full-length of the tendon. Centralizers shall be used full-length of the tendon.

Tiedown anchor holes in foundation material shall be drilled by either the rotary or percussion drilling method.

Prior to installing each tiedown anchor into the anchor hole, the anchor shall be clean and free of oil, grease, dirt or other extraneous substance.

The transition between the corrugated plastic sheathing and the anchorage assembly shall be an approved detail that allows stressing to the design force without evidence of distress in the corrugated plastic sheathing.

Tiedown anchor steel shall be protected prior to completion of all grouting against rust, corrosion and physical damage as provided in Section 50 of the Standard Specifications. In addition, there shall be no evidence of distress in the plastic sheathing or crushing of the cement grout within the sheathing.

Pregrouting shall occur at least 48 hours before placing the tendon in the drilled hole.

Tiedown anchor grout placed in the drilled hole shall be placed using grout tubes.

Grout for all stages shall be injected at the low end of the void being filled and shall be expelled at the high end until there is no evidence of entrapped air, water or diluted grout.

After initial grouting, the tiedown anchor shall remain undisturbed until the grout has reached a strength sufficient to provide anchorage during load testing.

Secondary grouting shall be completed after the tiedown anchor has been locked off at the required load.

Bars for multiple bar tendons shall be stressed simultaneously.

Additional requirements for tiedowns with bar type tendons are as follows:

The bar tendons in the unbonded area shall be sheathed with smooth plastic that extends into the steel tube of the permanent tieback anchorage assembly, as shown on the plans. For this portion of smooth sheathing there is no minimum wall thickness and the sheathing shall be either PVC or HDPE.

In addition, bar tendons shall be sheathed full-length with corrugated plastic. The annular space between the bar and the corrugated sheathing shall be pregrouted prior to placing the tendons in the drilled hole.

There shall be a seal between the smooth sheathing and the corrugated sheathing at the top and bottom of the length of smooth sheathing.

For bar tendons, the initial grout in the drilled hole may be placed before or after insertion of the bar tendons.

For drilled holes 6 inches in diameter or less, the initial grouting outside of the corrugated plastic sheathing shall extend to two feet below the end of the steel tube of the anchorage assembly. For drilled holes greater than 6 inches in diameter the initial grouting outside of the corrugated plastic sheathing shall be within the limits of the bonded length.

Additional requirements for tiedowns with strand type tendons are as follows:

Strand tendons shall be sheathed with corrugated plastic. The individual strands within the bonded length shall be separated by spaces so that the entire surface of each strand is bonded in the grout.

At the Contractor's option, the strands may be pregrouted in the corrugated plastic sheathing within the bond length. If the corrugated sheathing is pregrouted before placing the tendon in the drilled hole, the corrugated sheathing shall lap the smooth sheathing on the strands by 2 feet and be completely filled with grout at the time of pregrouting. If the corrugated sheathing is not pregrouted within the full length of the bonded length before placing the tendon in the drilled hole, the corrugated sheathing shall extend the full length of the tendon and shall be grouted after placing the tendon in the drilled hole except for a minimum length of 2 feet at the bottom of the tendon that shall be pregrouted before placing the tendon in the drilled hole. The annulus between the strands and the corrugated sheathing shall be grouted prior to placing the initial grout in the drilled hole.

Grout shall not be placed in the drilled hole until the strand tendons are installed complete in place in the drilled hole.

Testing.--All tiedowns shall be load tested by either a performance test or a proof test. The magnitude of applied test loads shall be determined with a calibrated pressure gauge or a load cell. Movements of the end of the tiedown anchor, relative to an independent fixed reference point, shall be measured and recorded to the nearest 0.001 inch at each load increment during the load tests. The Contractor shall perform the measuring and recording.

At the completion of testing tiedown anchors, or when requested by the Engineer, the Contractor shall furnish to the Engineer complete test results for each tiedown anchor tested. Data for each test shall list key personnel, test loading equipment, tiedown anchor location, hole diameter, method of drilling, and bonded and unbonded length of tiedown anchor. Test data shall also list quantity of grout and grout pressure used within the bonded length of the tiedown anchor, amount of ground water encountered, the time and dates of drilling, tiedown anchor installation, grouting, and testing. The tiedown anchor end movements at each increment of load or at each increment of time during the load hold period of the loading schedule shall be included in the test data.

Load testing shall be performed against temporary bearing yokes that bear directly against the permanent bearing plate. Tiedown anchors shall not be stressed against new footing concrete until the concrete has attained a compressive strength of 2600 pounds per square inch. Temporary yokes shall remain the property of the Contractor.

A minimum of 2 tiedown anchors shall be performance tested at each footing. The Engineer shall determine the location of the tiedown anchors to be performance tested.

The performance test or proof test shall be conducted by measuring the test load applied to the tiedown anchor and recording the tiedown anchor end movement (measured at the end of the tiedown anchor) during incremental loading and unloading the tiedown anchor in accordance with the loading schedule. The test load shall be held constant for 10 minutes. During the load hold, the movement of the end of the tiedown anchor shall be measured at 1, 2, 3, 4, 5, 6, and 10 minutes. If the total recorded movement between one minute and 10 minutes exceeds 0.04 inch, the test load shall be held for an additional 50 minutes. Total movement shall be measured at 15, 20, 25, 30, 45, and 60 minutes. If the load is held for 60 minutes, a creep curve showing the creep movement between one minute and 60 minutes shall be plotted as a function of the logarithm of time.

LOADING SCHEDULES		
PERFORMANCE TEST		PROOF TEST
	(CONT'D)	
AL	AL	AL
0.20T	0.20T	0.20T
AL	0.40T	0.40T
0.20T	0.60T	0.60T
0.40T	0.80T	0.80T
AL	1.00T (TEST LOAD)	1.00T (TEST LOAD)
0.20T	AL	AL
0.40T		
0.60T		
AL		
0.20T		
0.40T		
0.60T		
0.80T (CONT'D)		
T = Design force for the tiedown anchor shown on the plans AL = Alignment load = 0.10T		

For performance and proof tests, each increment of load shall be applied in less than one minute and held for at least one minute but not more than 2 minutes or as specified above. The observation period for the load hold shall start when the pump begins to apply the last increment of load.

The jacking equipment, including the tiedown anchor movement measuring system, shall be stable during all phases of the tiedown anchor loading operations.

All tiedown anchors not performance tested shall be proof tested. If 1.0 times the design force cannot be obtained, the tiedown anchor shall be replaced. Tiedown anchors shall not be retested, unless the tiedown bond length is post-grouted after the unacceptable test.

A performance tested or proof tested tiedown anchor shall conform to the following acceptance criteria:

1. The measured elastic movement of the end of the tiedown tendon exceeds 0.80 of the theoretical elongation of the unbonded length plus the jacking length at the maximum test load; and
2. The creep movement of the end of the tiedown anchor, between one and ten minutes, is less than 0.04 inches.

Lock-off.--After successful testing of the tiedown anchors, the tiedown anchors shall be locked off at a force equal to the lock off force shown on the plans. The lock-off force is the load on the jacks that is maintained while the tiedown anchor head or anchor nuts on the tiedown anchor are permanently set. Immediately after lock-off, a lift-off test shall be performed to demonstrate that the specified lock-off force was obtained. Adjustments in the shim thickness shall be made if required to achieve the specified lock-off force.

For strand tendons, the permanent wedges shall be fully set in the tiedown anchor head while the tendon is stressed to the test load of 1.0T, and then locked off at the lock-off force by removal of the shims or other appropriate means.

After lock-off, the grout shall be extended to the secondary grout level shown on the plans. At least 24 hours after the secondary grout has set, the remaining void in the steel tube and bearing plate shall be filled with grout. Grout shall be injected at the low end and expelled at the high end until there is no evidence of entrapped air or water. A minimum grout head of 2 feet shall be maintained until the grout has set.

The tiedown anchor head or anchor nuts shall be enclosed with a grouted anchorage enclosure device. After grouting the steel tube, the bearing plate surface shall be cleaned, silicon sealant placed, and the anchorage enclosure bolted in place. After bolting the anchorage enclosure in place the void in the anchorage enclosure shall be filled with grout by injecting grout at the low end of the void and venting at the high end. Any holes in the top of the anchorage enclosure used for grout placement shall be cleaned and sealed with silicon sealant.

MEASUREMENT AND PAYMENT.--No payment will be made for tiedown anchors that do not pass the specified testing requirements.

Tiedown anchors will be measured and paid for by the unit, and the number for payment will be determined by the requirements of the details shown on the plans. No change in the number of tiedown anchors to be paid for will be made because of the use by the Contractor of an alternative number of tiedown anchors.

The contract unit price paid for tiedown anchor shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the tiedown anchors (including testing), complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.20 CONCRETE STRUCTURES

Portland cement concrete structures shall conform to the provisions in Section 51, "Concrete Structures," of the Standard Specifications and these special provisions.

GENERAL.--Shotcrete shall not be used as a alternative construction method for reinforced concrete members unless otherwise specified.

The first sentence of the tenth paragraph in Section 51-1.05, "Forms," of the Standard Specifications is amended to read:

Form panels for exposed surfaces shall be plywood conforming to or exceeding the requirements of U.S. Product Standard PS 1 for Exterior B-B (Concrete Form) Class I Plywood or any material which will produce a smooth uniform concrete surface substantially equal to that which would result from the use of such plywood.

The second paragraph in Section 51-1.22, "Measurement," of the Standards Specifications is amended to read:

The estimated quantity of concrete for minor structures designated as final pay in the Engineer's Estimate will not be revised as specified in Section 9-1.015, "Final Pay Items," of the Standard Specifications, when the constructed height of said minor structure, including revisions by the Engineer, is within 0.5-foot of the vertical dimension shown on the plans.

CONCRETE.-- Concrete portions of the isolation joints shall contain not less than 658 pounds of cement per cubic yard and shall be constructed using concrete with a non-chloride Type C chemical admixture. Said concrete shall be cured at least 6 hours prior to opening to public traffic.

Portland cement for use in concrete using a non-chloride Type C chemical admixture shall be Type II Modified, Type II Prestress, or Type III. Type II Modified and Type III cement shall conform to the provisions in Section 90-2.01, "Portland Cement," of the Standard Specifications. Type II Prestress cement shall conform to the requirements of Type II Modified cement, except the mortar containing the portland cement to be used and Ottawa sand, when tested in accordance with California Test 527, shall not contract in air more than 0.053 percent.

The non-chloride Type C chemical admixture shall be approved by the Engineer and conform to the requirements ASTM Designation: C 494 and Section 90-4, "Admixtures," of the Standard Specifications.

The concrete with non-chloride Type C chemical admixture shall be prequalified prior to placement in accordance with the provisions for prequalification of concrete specified by compressive strength in Section 90-9.01, "General," of the Standard Specifications and the following:

Immediately after fabrication of the 5 test cylinders, the cylinders shall be stored in a temperature medium of 70 ± 3 degrees F until the cylinders are tested.

The 6-hour average strength of the 5 test cylinders shall not be less than 850 psi. No more than 2 test cylinders shall have a strength of less than 800 psi.

The top surface of isolation joint concrete shall be finished in conformance with the provisions in Section 51-1.17, "Finishing Bridge Decks," of the Standard Specifications. The finished top surface shall not vary more than 0.02-foot from the lower edge of a 12-foot straightedge placed parallel with the centerline.

The surface of the isolation joint concrete will not be profiled and the Profile Index requirements shall not apply.

Isolation joint concrete shall be cured with pigmented curing compound (1) in accordance with the provisions for curing structures in Section 90-7.01B, "Curing Compound Method," of the Standard Specifications. The minimum curing period of 6 hours shall be considered to begin at the start of discharge of the last truck load of concrete to be used in the isolation joint. Fogging of the surface with water after the curing compound has been applied will not be required. Should the film of curing compound be damaged from any cause before the joint is opened to public traffic, the damaged portion shall be repaired immediately with additional compound, at the Contractor's expense. Any damage to the curing compound after the joint is opened to public traffic shall not be repaired.

If the ambient temperature is below 65° F during the curing period, an insulating layer or blanket shall cover the surface. The insulation layer or blanket shall have an R-value rating given in the table below. At the Contractor's option, a heating tent may be used in lieu of or in combination with the insulating layer or blanket.

TEMPERATURE RANGE DURING CURING PERIOD R-VALUE, MINIMUM

55° F. through 64° F.	1
45° F. through 54° F.	2
40° F. through 44° F.	3

Tests to determine the coefficient of friction of the final textured surface will be made only if the Engineer determines by visual inspection that the final texturing may not have produced a surface having the specified coefficient of friction. Any tests to determine the coefficient of friction will be made after the joint is opened to public traffic, but not later than 5 days after concrete placement. The coefficient of friction will be measured by California Test 342. Any portions of completed concrete surfaces that are found to have a coefficient of friction less than 0.35 shall be ground or grooved parallel to the center line in accordance with the requirements for bridge decks of Section 42, "Groove and Grind Pavement," of the Standard Specifications.

FALSEWORK.--Falsework shall be designed and constructed in conformance with the requirements in Section 51-1.06, "Falsework," of the Standard Specifications and these special provisions.

Section 51-1.06A, "Falsework Design and Drawings," of the Standard Specifications is amended by adding the following after the first paragraph:

The falsework drawings shall include details of the falsework removal operations showing the methods and sequences of removal and equipment to be used.

The seventeenth paragraph of Section 51-1.06A is amended to read:

Temporary bracing shall be provided, as necessary, to withstand all imposed loads during erection, construction and removal of any falsework. The falsework drawings shall show provisions for such temporary bracing or methods to be used to conform to this requirement during each phase of erection and removal. Wind loads shall be included in the design of such bracing or methods.

The fifth paragraph of Section 51-1.06A(1), "Design Loads," of the Standard Specifications is amended to read:

The minimum horizontal load to be allowed for wind on heavy-duty steel shoring or steel pipe column falsework having a vertical load carrying capacity exceeding 30 kips per leg or column shall be the sum of the products of the wind impact area, shape factor, and the applicable wind pressure value for each height zone. The wind impact area is the total projected area of all the elements in the tower face or falsework bent normal to the direction of the applied wind. The shape factor shall be taken as 2.2 for heavy-duty shoring and 1.0 for pipe column falsework. Wind pressure values shall be determined from the following table:

Height Zone (Feet above ground)	Wind Pressure Value	
	Shores or Columns Adjacent to Traffic	At Other Locations
0 to 30	20 psf	15 psf
30 to 50	25 psf	20 psf
50 to 100	30 psf	25 psf
Over 100	35 psf	30 psf

The first 2 sentences of the sixth paragraph of Section 51-1.06A(1), "Design Loads," of the Standard Specifications are amended to read:

The minimum horizontal load to be allowed for wind on all other types of falsework, including falsework supported on heavy-duty shoring or pipe column falsework, shall be the sum of the products of the wind impact area and the applicable wind pressure value for each height zone. The wind impact area is the gross projected area of the falsework and any unrestrained portion of the permanent structure, excluding the areas between falsework bents or towers where diagonal bracing is not used.

The second entry under "Timber" in the second paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

Compression parallel to the grain $\frac{480,000}{(L/d)^2}$ psi, but not to exceed 1,600 psi.

The last paragraph under "Timber" in the second paragraph of Section 51-1.06A(2), "Design Stresses, Loadings, and Deflections," of the Standard Specifications is amended to read:

Timber connections shall be designed in accordance with the procedures, stresses and loads permitted in the Falsework Manual as published by the Department of Transportation, Division of Structures, Office of Structure Construction.

The third paragraph of Section 51-1.06B "Falsework Construction" of the Standard Specifications is amended to read:

When falsework is supported on piles, the piles shall be driven and the actual bearing value assessed in conformance with Section 49, "Piling," as specified in these specifications.

For falsework piles with a calculated loading capacity greater than 100 tons, the contractor shall conduct dynamic monitoring of pile driving and conduct penetration and bearing analyses based on a wave equation analysis. Said analysis shall be signed by an Engineer who is licensed as a Civil Engineer in California and submitted to the Engineer prior to completion of falsework erection.

The first paragraph of Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended to read:

Falsework supporting any span of a simple span bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed. Unless otherwise permitted by the Engineer, falsework supporting any span of a continuous or rigid frame bridge shall not be released before 10 days after the last concrete, excluding concrete above the bridge deck, has been placed in that span and in the adjacent portions of each adjoining span for a length equal to at least 1/2 the length of the span where falsework is to be released.

Section 51-1.06C, "Removing Falsework," of the Standard Specifications is amended by adding the following after the seventh paragraph:

Unless otherwise specified, removing falsework supporting any span of structural members subject to bending, shall conform to the requirements for removing falsework supporting any span of a simple span bridge.

ELASTOMERIC BEARING PADS.--Elastomeric bearing pads shall conform to the provisions in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications and these special provisions.

The fifth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearings," of the Standard Specifications is amended to read:

The peel strength test will be performed after immersing the sample in water for a minimum of 10 days. The bond between elastomer and fabric shall be such that when a sample is tested for separation, it shall have a minimum peel strength of 30 pounds per inch when tested in accordance with California Test 663.

The last 2 sentences of the tenth paragraph of Section 51-1.12H(1), "Plain and Fabric Reinforced Elastomeric Bearings," of the Standard Specifications are amended to read:

Pads shall be available for sampling at least 4 weeks in advance of intended use. All sample pads for testing shall be furnished by the Contractor at his expense.

The fifth subparagraph of the first paragraph of Section 51-1.12H(2), "Steel Reinforced Elastomeric Bearings," of the Standard Specifications is amended to read:

One sample bearing shall be furnished to the Engineer from each lot of bearings to be furnished for the contract. Samples shall be available at least 3 weeks in advance of intended use. The sample bearing shall be one of the following:

BEARING PAD THICKNESS AS SHOWN ON THE PLANS

2 inches or less.....

Greater than 2 inches.....

SAMPLE BEARING

Smallest complete bearing shown on the plans.

* 2.25±0.125 inch thick sample not less than 8 inches by 12 inches in plan and cut by the manufacturer from the center of one of the thickest complete bearings.

* The sample bearing plus remnant parts of the complete bearing shall be furnished to the Engineer.

MEASUREMENT AND PAYMENT.--Measurement and payment for concrete in structures shall conform to the provisions in Sections 51-1.22, "Measurement," and 51-1.23, "Payment," of the Standard Specifications and these special provisions.

Full compensation for roughening existing concrete surfaces to a full amplitude of approximately 1/4-inch, where shown on the plans, shall be considered as included in the contract price paid per cubic yard for structural concrete, bridge and no separate payment will be made therefor.

Full compensation for reusing existing expansion bearings shall be considered as included in the contract price paid per cubic yard for structural concrete, bridge and no additional compensation will be allowed therefor.

Full compensation for grinding existing concrete surfaces at isolation joints shall be considered as included in the contract price paid per cubic yard for structural concrete, bridge and no additional compensation will be allowed therefor.

Full compensation for loading, transporting and disposing of contaminated (hazardous) material, and furnishing, installing and removing impermeable barriers, shall be included in the contract price paid per cubic yard for minor concrete (minor structure) (hazardous material) and no additional compensation will be allowed therefor.

10-1.21 DRILL AND BOND DOWEL (EPOXY CARTRIDGE)

Drilling and bonding dowels with epoxy cartridges shall conform to the details shown on the plans and the requirements in these special provisions.

Reinforcing steel dowels shall conform to the provisions in "Reinforcement" of these special provisions.

Threaded rods used as dowels shall conform to the provisions in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications, except that galvanizing will not be required. The threaded rods shall be installed in accordance with these requirements for dowels specified herein.

The Contractor shall select an epoxy cartridge system which has passed the testing requirements of the International Conference of Building Officials (ICBO) document - AC58 and additional test requirements as specified in the Caltrans Augmentation/Revisions to ICBO AC58. Testing shall be performed by an independent testing facility and the results will be reviewed and approved by the Transportation Laboratory. The Caltrans Augmentation/Revisions to ICBO AC58 document may be obtained by contacting the Transportation Laboratory, telephone: (916) 227-7000.

The epoxy cartridge system used shall be appropriate for the ambient concrete temperature and installation conditions at the time of installation in accordance with the manufacturer's specifications.

Epoxy cartridges shall be accompanied by a Certificate of Compliance as provided in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. The certificate shall state that the material complies in all respects to the specifications and data submitted in obtaining approval.

Each epoxy cartridge shall be clearly and permanently marked with the manufacturer's name, model number of the epoxy cartridge system, manufacturing date, and lot number. Each carton of epoxy cartridges shall contain the manufacturer's recommended installation procedures, minimum cure time, and such warning or precautions concerning the contents as may be required by State or Federal Laws and Regulations.

The holes shall be drilled by methods that will not shatter or damage the concrete adjacent to the holes. If reinforcement is encountered during drilling, before specified depth is attained, the Engineer shall be notified. Unless the Engineer approves, in writing, coring through the reinforcement, the hole will be rejected and a new hole, in which reinforcement is not encountered, shall be drilled adjacent to the rejected hole to the depth shown on the plans.

The drilled holes shall be cleaned in accordance with the manufacturer's instructions and shall be dry at the time of placing the epoxy cartridge bonding material and the steel dowels. The bonding material shall be a two-component epoxy system contained in a cartridge having two separate chambers and shall be inserted into the hole using a dispensing gun and replaceable mixing nozzle approved by the manufacturer. Unless otherwise specified, the installation procedure shall be as recommended by the manufacturer. The depths of holes shall be as shown on the plans. A copy of the manufacturer's recommended installation procedure shall be provided to the Engineer 2 days prior to the start of work.

Immediately after inserting the dowels into the epoxy, the dowels shall be supported as necessary to prevent movement during curing and shall remain undisturbed until the epoxy has cured a minimum time as specified by the

manufacturer. Dowels that are improperly bonded, as determined by the Engineer, will be rejected. Adjacent new holes shall be drilled, and new dowels shall be placed and securely bonded to the concrete. All work necessary to correct improperly bonded dowels shall be performed at the Contractor's expense.

Unless otherwise provided, reinforcing steel dowels and threaded rods to be bonded into drilled holes will be measured and paid for as bar reinforcing steel (bridge).

Unless otherwise provided, drill and bond dowel (epoxy cartridge) will be measured and paid for as drill and bond dowel.

10-1.22 DRILL AND BOND DOWELS

Drilling and bonding dowels shall conform to the details shown on the plans, the provisions in Section 83-2.02D(1), "General," of the Standard Specifications and these special provisions.

Bar reinforcing steel dowels shall conform to the provisions for bar reinforcement in "Reinforcement" elsewhere in these special provisions.

If reinforcement is encountered during drilling, before specified depth is attained, the Engineer shall be notified. Unless the Engineer approves coring through the reinforcement, the hole will be rejected and a new hole, in which reinforcement is not encountered, shall be drilled adjacent to the rejected hole to the depth shown on the plans.

Unless otherwise provided, bar reinforcing dowels to be bonded into drilled holes will be paid for as bar reinforcing steel (bridge).

Unless otherwise provided, drilling and bonding dowels will be measured and paid for by the linear foot determined by the number and the required depth of holes as shown on the plans, or as ordered by the Engineer.

The contract price paid per linear foot for drill and bond dowel shall include full compensation for furnishing all labor, materials (except reinforcing steel dowels), tools, equipment, and incidentals, and for doing all the work involved in drilling the holes, including coring through reinforcement when approved by the Engineer, and bonding the dowels, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.23 DRILL AND PRESSURE GROUT

Drilling concrete and pressure grouting shall consist of drilling through reinforced concrete bridge members, placing bar reinforcing steel, and filling holes with hydraulic-cement grout, as shown on the plans and in conformance with the requirements in these special provisions.

Drilling shall conform to the details shown on the plans, the provisions in Section 83-2.02D(1), "General," of the Standard Specifications and these special provisions.

If reinforcement is encountered during drilling, before specified depth is attained, the Engineer shall be notified. Unless the Engineer approves coring through the reinforcement, the hole will be rejected and a new hole, in which reinforcement is not encountered, shall be drilled adjacent to the rejected hole to the depth shown on the plans.

Bar reinforcement to be placed in the cored holes shall conform to the provisions for bar reinforcement in "Reinforcement" elsewhere in these special provisions.

Bar reinforcement to be grouted into drilled holes will be paid for as bar reinforcing steel (bridge).

Concrete areas to be in contact with the grout shall be cleaned of all loose or foreign material that would in any way prevent bond between the concrete surfaces and shall be flushed with water and allowed to dry to a surface dry condition immediately prior to grouting.

Grout shall be a non-shrink grout, premixed package blend of portland cement, graded silica sand and water reducing, plasticizing and time release expansion agents, which conforms to ASTM Designation: C 1107, Grade B and provides a minimum 5000 psi compressive strength at 28 days. The grout shall be mixed in accordance with the manufacturer's recommendations. Water shall comply with the provisions in Section 90-2.03, "Water".

Admixtures shall not contain more than 500 parts per million of chlorides as Cl, when tested by California Test 422, and shall not contain more than 2500 parts per million of sulfates as SO₄, when tested by California Test 417.

After placement of reinforcement, ends of the drilled hole containing the reinforcement shall be sealed, with one vent tube and a injection feed tube. The tubes shall be placed in the hole in a manner which will allow the air to vent and the hole to completely filled with grout. Sufficient pressure shall be achieved to ensure that the hole is free of voids. Grout shall be pumped through the holes and continually wasted until no visible slugs or other visible evidence of water or air are ejected and the efflux time of ejected grout is not less than 11 seconds.

Grout and water shall not be permitted to fall into any waterway, on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Drilling and pressure grouting will be measured and paid for by the linear foot as drill and pressure grout. The drilled hole will be measured along the centerline of the hole without deduction for expansion joints.

The contract price paid per linear foot for drill and pressure grout shall include full compensation for furnishing all labor, materials (including grout), tools, equipment, and incidentals, and for doing all work involved in drilling the holes,

including coring through reinforcement when approved by the Engineer, placing reinforcement in the holes, and pressure grouting the holes, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.24 CORE CONCRETE

Coring concrete shall consist of coring holes through reinforced concrete bridge members as shown on the plans and in conformance with the requirements in these special provisions.

The holes shall be cored by methods that will not shatter or damage the concrete adjacent to the holes.

Water for core drilling operations shall be from the local domestic water supply or shall not contain more than 1,000 parts per million of chlorides as Cl, nor more than 1,300 parts per million of sulfates as SO₄, nor shall it contain any impurities in a sufficient amount to cause discoloration of the concrete or produce etching of the surface.

Water from core drilling operations shall not be permitted to fall on public traffic, to flow across shoulders or lanes occupied by public traffic, or to flow into gutters or other drainage facilities.

Coring concrete will be measured and paid for by the linear foot as core concrete of the sizes listed in the Engineer's Estimate. The cored concrete will be measured along the centerline of the hole without deduction for expansion joints.

The contract price paid per linear foot for core concrete of the sizes listed in the Engineer's Estimate shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all work involved in coring the holes, including control of water from core drilling and repairing any damaged reinforcement, as shown on the plans, as specified in these special provisions, and as directed by the Engineer.

10-1.25 SEALING JOINTS

Polyurethane seals and polyethylene foam shall conform to the requirements for Type A seals as specified in Section 51-1.12F(3), "Materials and Installation," of the Standard Specifications and these special provisions.

Immediately prior to placing the seal, the joints shall be cleaned to remove all residue and foreign material. Joint surfaces shall be dry at the time the seal is placed.

The contract price paid per linear foot for joint seal shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in constructing the joint seals, complete in place, including cleaning the joint, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.26 REINFORCEMENT

Reinforcement shall conform to the provisions in Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

Attention is directed to "Welding Quality Control" elsewhere in these special provisions.

The first paragraph of Section 52-1.02A, "Bar Reinforcement," of the Standard Specifications is amended as follows:

Reinforcing bars shall be low-alloy steel deformed bars conforming to the specifications of ASTM Designation: A 706/A 706M, except that deformed or plain billet-steel bars conforming to ASTM Designation: A 615/A 615M, Grade 40 or 60, may be used as reinforcement in the following:

1. Slope and channel paving;
2. Minor structures;
3. Sign and signal foundations (pile and spread footing types);
4. Roadside rest facilities; and
5. Concrete barrier Type 50 and Type 60 series and temporary railing.

Deformations specified in ASTM Designation: A 706/A 706M will not be required on bars used as spiral or hoop reinforcement in structures and concrete piles.

Section 52-1.02D, "Reinforcing Wires and Plain Bars," of the Standard Specifications is amended to read:

52-1.02D Reinforcing Wire.—Wire used as reinforcement in structures and concrete piles, as shown on the plans, shall be cold drawn steel wire conforming to the specifications of ASTM Designation: A 82.

The last paragraph of Section 52-1.07, "Placing," of the Standard Specifications is amended to read:

Whenever a portion of an assemblage of bar reinforcing steel that is not encased in concrete exceeds 20 feet in height, the Contractor shall submit to the Engineer for approval, in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings," working drawings and design calculations for the temporary support system to be

used. The working drawings and design calculations shall be signed by an engineer who is registered as a Civil Engineer in the State of California. The temporary support system shall be designed to resist all expected loads and shall be adequate to prevent collapse or overturning of the assemblage. If the installation of forms or other work requires revisions to or temporary release of any portion of the temporary support system, the working drawings shall show the support system to be used during each phase of construction. The minimum horizontal wind load to be applied to the bar reinforcing steel assemblage, or to a combined assemblage of reinforcing steel and forms, shall be not less than 20 pounds per square foot on the gross projected area of the assemblage.

The sixth paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

Except when otherwise specified, mechanical lap splicing shall conform to the details shown on the plans, the requirements for mechanical butt splices as specified in this Section 52-1.08, and Sections 52-1.08C, "Mechanical Butt Splices," 52-1.08D, "Qualification of Welding and Mechanical Splicing," and 52-1.08E, "Job Control Tests," and the following:

The mechanical lap splice shall be a unit consisting of a sleeve, in which the reinforcing bars are positioned, and a wedge driven through holes in the sleeve and between the reinforcing bars. The mechanical lap splice shall only be used for splicing non-epoxy-coated deformed reinforcing bars Nos. 4, 5 and 6. One mechanical lap splice unit per splice shall be used.

The eighth and ninth paragraphs of Section 52-1.08, "Splicing," of the Standard Specifications are amended to read:

Unless otherwise shown on the plans or approved by the Engineer, splices in adjacent reinforcing bars at any particular section shall be staggered. The minimum distance between staggered lap splices or mechanical lap splices shall be the same length required for a lapped splice in the largest bar. The minimum distance between staggered butt splices shall be 2 feet. All distances shall be measured between the midpoints of the splices along a line which is centered between the axes of the adjacent bars.

Completed butt splices shall develop a minimum tensile strength, based on the nominal bar area, of 63,000 psi for ASTM Designation: A 615/A 615M Grade 40 bars, and of 80,000 psi for ASTM Designation: A 615/A 615M Grade 60 and ASTM Designation: A 706/A 706M bars. If butt splices are made between two bars of dissimilar strengths, the minimum required tensile strength for the splice shall be that required for the weaker bar.

The second sentence of the eleventh paragraph of Section 52-1.08, "Splicing," of the Standard Specifications is amended to read:

Job control tests shall be made on sample splices representing each lot of mechanical butt splices as provided in Section 52-1.08E, "Job Control Tests."

Section 52-1.08B, "Butt Welded Splices," of the Standard Specifications is replaced with the following:

52-1.08B Butt Welded Splices.— All butt welded splices in reinforcing bars shall be complete joint penetration butt welds conforming to the requirements in AWS D1.4, and the requirements of these specifications and the special provisions. At the option of the Contractor, shop produced resistance butt welds that are produced by a fabricator who is approved by the Transportation Laboratory may be used.

Only the joint details and dimensions as shown in Figure 3.2, "Direct Butt Joints," of AWS D 1.4-92, shall be used for making complete joint penetration butt welds of bar reinforcement. Split pipe backing shall not be used.

Material used as backing for complete joint penetration butt welds of bar reinforcement shall be a flat plate conforming to the requirements of ASTM Designation: A 709, Grade 36. The flat plate shall be 0.25-inch thick with a width, as measured perpendicular to the axis of the bar, equal to the nominal diameter of the bar, and a length which does not exceed twice the nominal diameter of the bar. The flat plate backing shall be fitted tightly to the bar with the root of the weld centered on the plate. Any bar deformation or obstruction preventing a tight fit shall be ground smooth and flush with the adjacent surface. Tack welds used to fit backing plates shall be within the weld root area so that they are completely consumed by the finished weld. Backing plates shall not be removed.

Butt welds shall be made with multiple weld passes using a stringer bead without an appreciable weaving motion. The maximum stringer bead width shall be 2.5 times the diameter of the electrode and slagging shall be performed between each weld pass. Weld reinforcement shall not exceed 1/8-inch in convexity.

Before any electrodes or flux-electrode combinations are used, the Contractor, at the Contractor's expense, shall furnish certified copies of test reports for all the pertinent tests specified in AWS A5.1, AWS A5.5, AWS A5.18 or AWS A5.20, whichever is applicable, made on electrodes or flux-electrode combinations of the same class, brand and nearest specified size as the electrodes to be used. The tests may have been made for process qualification or

quality control, and shall have been made within one year prior to manufacture of the electrodes and fluxes to be used. The report shall include the manufacturer's certification that the process and material requirements were the same for manufacturing the tested electrodes and the electrodes to be used. The forms and certificates shall be as directed by the Engineer.

Electrodes for manual shielded metal arc welding of ASTM Designation: A 615/A 615M, Grade 60 bars shall conform to the requirements of AWS A5.5 for E9018-M or E10018-M electrodes.

Electrodes for manual shielded metal arc welding of A 706/A 706M bars shall conform to the requirements of AWS A5.5 for E8016-C3 or E8018-C3 electrodes.

Solid and composite electrodes for semiautomatic gas metal-arc and flux-cored arc welding of Grade 40 reinforcing bars shall conform to the requirements of AWS A5.18 for ER70S-2, ER70S-3, ER70S-6 or ER70S-7 electrodes; or AWS A5.20 for E70T-1, E70T-5, E70T-6 or E70T-8 electrodes.

Electrodes for semiautomatic welding of ASTM Designation: A 615/A 615M, Grade 60 and ASTM Designation: A 706/A 706M bars shall produce a weld metal deposit with properties conforming to the requirements of Section 5.3.4 of AWS D1.1-96 for ER80S-Ni1, ER80S-Ni2, ER80S-Ni3, ER80S-D2, E90T1-K2 and E91T1-K2 electrodes.

Reinforcing bars shall be preheated for a distance of not less than 6 inches on each side of the joint prior to welding.

For all welding of ASTM Designation: A 615/A 615M, Grade 40 or Grade 60 bars, the requirements of Table 5.2, "Minimum Preheat and Interpass Temperatures," of AWS D1.4-92 are superseded by the following:

The minimum preheat and interpass temperatures shall be 400° F. for Grade 40 bars and 600° F. for Grade 60 bars. Immediately after completing the welding, at least 6 inches of the bar on each side of the splice shall be covered by an insulated wrapping to control the rate of cooling. The insulated wrapping shall remain in place until the bar has cooled below 200° F.

When welding different grades of reinforcing bars, the electrode shall conform to Grade 40 bar requirements and the preheat shall conform to the Grade 60 bar requirements.

In the event that any of the specified preheat, interpass and post weld cooling temperatures are not met, all weld and heat affected zone metal shall be removed and the splice rewelded.

All welding shall be protected from air currents, drafts, and precipitation to prevent loss of heat or loss of arc shielding. The method of protecting the welding area from loss of heat or loss of arc shielding shall be subject to approval by the Engineer.

Reinforcing bars shall not be direct butt spliced by thermite welding.

The first paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications is amended to read:

Mechanical butt splices shall be the sleeve-filler metal type, the sleeve-threaded type, the sleeve-swaged type, the sleeve-filler grout type, the sleeve-lockshear bolt type, the two-part sleeve-forged bar type, or the two-part sleeve-friction bar type, at the option of the Contractor.

The following is added after the third paragraph of Section 52-1.08C, "Mechanical Butt Splices," of the Standard Specifications:

Slip requirements shall not apply to mechanical lap splices.

The following is added after Section 52-1.08C(3), "Sleeve-Swaged Mechanical Butt Splices," of the Standard Specifications:

52-1.08C(4) Sleeve-Filler Grout Mechanical Butt Splices.—The sleeve-filler grout type of mechanical butt splices shall consist of a steel splice sleeve that fits closely over the reinforcing bars with a non-shrink grout filler in the annular space between the reinforcing bars and the sleeve and between the ends of the reinforcing bars.

No vibration or movement of the reinforcing steel or sleeve at the splice shall be allowed while the splice is developing sufficient strength to support the reinforcing bars. The Contractor shall submit complete details of the bracing and clamping system to eliminate all vibration or movement at the splice during setup of the filler in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings."

52-1.08C(5) Sleeve-Lockshear Bolt Mechanical Butt Splices.—The sleeve-lockshear bolt type of mechanical butt splices shall consist of a seamless steel sleeve, 2 serrated steel strips welded to the inside of the sleeve, center

hole with centering pin, and bolts that are tightened until the bolt heads shear off and the bolt ends are embedded in the reinforcing bars.

52-1.08C(6) Two-Part Sleeve-Forged Bar Mechanical Butt Splices.— The two-part sleeve-forged bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve that interlocks two hot-forged reinforcing bars ends. The forged bar ends may be either shop produced or field produced.

52-1.08C(7) Two-Part Sleeve-Friction Bar Mechanical Butt Splices.— The two-part sleeve-friction bar type of mechanical butt splices shall consist of a shop machined two-part threaded steel sleeve whose ends are friction welded, in the shop, to the reinforcing bars ends.

The third paragraph of Section 52-1.08D, "Qualification of Welding and Mechanical Splicing," of the Standard Specifications is replaced with the following:

Each operator qualification test for mechanical splices shall consist of 2 sample splices. Each mechanical splice procedure test shall consist of 2 sample splices.

For sleeve-filler, sleeve-threaded, sleeve-lockshear bolt and two-part sleeve friction bar mechanical butt splices, all sample splices shall be made on the largest reinforcing bar size to be spliced by the procedure or operator being tested except that No. 14 bars may be substituted for No. 18 bars.

For sleeve-swaged and two-part sleeve-forged mechanical butt splices, and mechanical lap splices, all sample splices shall be made on the largest reinforcing bar size of each deformation pattern to be spliced by the procedure or operator being tested. When joining new reinforcing bars to existing reinforcement, the qualification test sample bars shall be made with the deformation pattern of the new reinforcement to be joined.

Section 52-1.08E, "Job Control Tests," of the Standard Specifications is replaced with the following:

52-1.08E Job Control Tests.— When mechanical butt splices, shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices are used, the Contractor shall furnish job control tests from a local qualified lab. A job control test shall consist of the fabrication, under conditions used to produce the splice, and the physical testing of 3 sample splices for each lot of splices.

A lot of mechanical butt splices is defined as 150, or fraction thereof, of the same type of mechanical butt splices used for each combination of bar size and bar deformation pattern that is used in the work.

A lot of shop produced complete joint penetration butt welded splices, or shop produced resistance butt welded splices, is defined as 150, or fraction thereof, of the same type of welds used for each combination of bar size and bar deformation pattern that is used in the work.

When joining new reinforcing bars to existing reinforcement, the job control test shall be made with the deformation pattern of the new reinforcement to be joined.

A sample splice shall consist of a splice made at the job site to connect two 30-inch, or longer, bars using the same splice materials, position, location, and equipment, and following the same procedures as are being used to make splices in the work. Shorter sample splice bars may be used if approved by the Engineer.

Sample splices shall be made and tested in the presence of the Engineer or the Engineer's authorized representative.

Sample splices shall be suitably identified with weatherproof markings prior to shipment to the testing laboratory.

For sleeve-threaded mechanical butt splices, the reinforcing bars to be used for job control tests shall be fabricated on a random basis during the cutting of threads on the reinforcing bars of each lot and shipped to the job site with the material they represent.

For shop produced complete joint penetration butt welds, shop produced resistance butt welded splices and all types of mechanical butt splices, except the sleeve-threaded type, the Engineer will designate when samples for job control tests are to be fabricated, and will determine the limits of the lot represented by each job control test.

Should the average of the results of tests made on the 3 sample splices or should more than one sample splice in any job control test fail to meet the requirements for splices, all splices represented by that test will be rejected in accordance with the provisions in Section 6-1.04, "Defective Materials," of the Standard Specifications. This rejection shall prevail unless the Contractor, at the Contractor's expense, obtains and submits evidence, of a type acceptable to the Engineer, that the strength and quality of the splices in the work are acceptable.

Section 52-1.08F, "Nondestructive Splice Tests" of the Standard Specifications is replaced with the following:

52-1.08F Nondestructive Splice Tests.—All required radiographic examinations of complete joint penetration butt welded splices shall be performed by the Contractor in accordance with the requirements of AWS D 1.4 and these specifications.

Prior to radiographic examination, welds shall meet the requirements of Section 4.4, "Quality of Welds," of AWS D1.4-92.

Radiographic examinations shall be performed on 25 percent of all complete joint penetration butt welded splices from a production lot. The size of a production lot will be a maximum of 100 splices. The Engineer will select the splices which will compose the production lot and also the splices within each production lot to be radiographically examined.

Should more than 12 percent of the splices which have been radiographically examined in any production lot be defective, an additional 25 percent of the splices, selected by the Engineer from the same production lot, shall be radiographically examined. Should more than 12 percent of the cumulative total of splices tested from the same production lot be defective, all remaining splices in the lot shall be radiographically examined.

Additional radiographic examinations performed due to the identification of defective splices shall be at the Contractor's expense.

All defects shall be repaired in accordance with the requirements of AWS D1.4.

Radiographic examinations will not be required for either shop produced complete joint penetration butt welds or shop produced resistance butt welded splices of No. 8 or smaller bars used as spiral or hoop reinforcement.

In addition to radiographic examinations performed by the Contractor, any mechanical or welded splice may be subject to inspection or nondestructive testing by the Engineer. The Contractor shall provide sufficient access facilities in the shop and at the jobsite to permit the Engineer or his agent to perform the inspection or testing.

The Contractor shall notify the Engineer in writing 48 hours prior to performing any radiographic examinations.

The radiographic procedure used shall conform to the requirements of ASME Boiler and Pressure Vessels Code, Section V, Article 2 and the following:

Two exposures shall be made for each complete joint penetration butt welded splice. For each of the two exposures, the radiation source shall be centered on each bar to be radiographed. The first exposure shall be made with the radiation source placed at zero degrees from the top of the weld and perpendicular to the weld root and identified with a station mark of "0." When obstructions prevent a zero degree placement of the radiation source for the first exposure, and when approved in writing by the Engineer, the source may be rotated, around the centerline of the reinforcing bar, a maximum of 25 degrees. The second exposure shall be at 90 degrees to the "0" station mark and shall be identified with a station mark of "90."

For field produced complete joint penetration butt welds, no more than one weld shall be radiographed during one exposure. For shop produced complete joint penetration butt welds, if more than one weld is to be radiographed during one exposure, the angle between the root line of each weld and the direction to the radiation source shall be not less than 65 degrees.

Radiographs shall be made by either X-ray or gamma ray. Radiographs made by X-ray or gamma rays shall have densities of not less than 2.3 nor more than 3.5 in the area of interest. A tolerance of 0.05 in density is allowed for densitometer variations. Gamma rays shall be from the iridium 192 isotope and the emitting specimen shall not exceed 0.175-inch in the greatest diagonal dimension.

The radiographic film shall be placed perpendicular to the radiation source at all times; parallel to the root line of the weld unless source placement determines that the film must be turned; and as close to the root of the weld as possible.

The minimum source to film distance shall be maintained so as to insure that all radiographs maintain a maximum geometric unsharpness of 0.020 at all times, regardless of the size of the reinforcing bars.

All penetrameters shall be placed on the source side of the bar and perpendicular to the radiation source at all times. One penetrameter shall be placed in the center of each bar to be radiographed, perpendicular to the weld root, and adjacent to the weld. Penetrameter images shall not appear in the weld area.

When radiography of more than one weld is being performed per exposure, each exposure shall have a minimum of one penetrameter per bar, or three penetrameters per exposure. When 3 penetrameters per exposure are used, one penetrameter shall be placed on each of the 2 outermost bars of the exposure, and the remaining penetrameter shall be placed on a centrally located bar.

An allowable weld buildup of 1/8 inch may be added to the total material thickness when determining the proper penetrameter selection. No image quality indicator equivalency will be accepted. Wire penetrameters or penetrameter blocks shall not be used.

Penetrameters shall be sufficiently shimmed using a radiographically identical material. Penetrameter image densities shall be a minimum of 2.0 and a maximum of 3.6.

All radiographic film shall be Class 1, regardless of the size of reinforcing bars.

Radiographs shall be free of film artifacts and processing defects, including, but not limited to, streaks, scratches, pressure marks, or marks made for the purpose of identifying film or welding indications.

Each splice shall be clearly identified on each radiograph and the radiograph identification and marking system shall be established between the Contractor and the Engineer before radiographic inspection begins. Film shall be identified by lead numbers only; etching, flashing, or writing in identifications of any type will not be permitted. Each piece of film identification information shall be legible and shall include, as a minimum, the following information: Contractor's name, date, name of nondestructive testing firm, initials of radiographer, contract number, part number, and weld number. The letter "R" and repair number shall be placed directly after the weld number to designate a radiograph of a repaired weld.

Radiographic film shall be developed within a time range of one minute less to one minute more than the film manufacturer's recommended maximum development time. Development on the jobsite will not be allowed.

Processing chemistry shall be done with a consistent mixture and quality, and processing rinses and tanks shall be clean to ensure proper results. Records of all developing processes and any chemical changes to the developing processes shall be kept and furnished to the Engineer upon request. The Engineer may request, at any time, that a sheet of unexposed film be processed in the presence of the Engineer to verify processing chemical and rinse quality.

All radiographs shall be interpreted and graded by a Level II or Level III technician who is qualified in accordance with the American Society for Nondestructive Testing's Recommended Practice No. SNT-TC-1A. The results of these interpretations shall be recorded on a signed certification and a copy kept with the film packet.

Technique sheets prepared in accordance with ASME Boiler and Pressure Vessels Code, Section V, Article 2 Section T-291 shall also contain the developer temperature, developing time, fixing duration and all rinse times.

All radiographic envelopes shall have clearly written on the outside of the envelope the following information: name of the Contractor's Quality Control Manager (QCM), name of the nondestructive testing firm, name of the radiographer, date, contract number, complete part description, and all included weld numbers or a report number, as detailed in the Contractor's Quality Control Plan (QCP). In addition, all innerleaves shall have clearly written on them the part description and all included weld numbers, as detailed in the Contractor's QCP.

10-1.27 CLEAN AND PAINT STRUCTURAL STEEL

All exposed new metal surfaces and connections to existing steel, except where galvanized, shall be cleaned and painted in accordance with the provisions in Sections 59-2, "Painting Structural Steel," and 91, "Paint," of the Standard Specifications and these special provisions.

The fifth paragraph in Section 59-1.03, "Application," of the Standard Specifications is amended to read:

Unless otherwise specified, should 7 days elapse between paint applications, the painted surface shall be water rinsed prior to the next paint application. Water rinsing shall be defined as a pressurized water rinse with a minimum nozzle pressure of 300 psi. During rinsing, the tip of the pressure nozzle shall be placed between 12 and 18 inches from the surface to be rinsed.

The first subparagraph of the first paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

Structures, other than sign structures, shall be blast cleaned and painted with the total thickness of undercoats before erection. Finish coats and final coats shall be applied after erection. If concrete deck is to be placed on a steel member to be painted, finish coats and final coats shall be applied after concrete deck placement. After erection, deck placement, and before applying subsequent paint, all areas where paint has been damaged or has deteriorated and all exposed unpainted surfaces shall be thoroughly cleaned, all foreign substances shall be removed, and surfaces shall be spot painted with undercoats to the specified thickness. Damaged areas of undercoat paint shall be blast cleaned and painted as specified in the special provisions.

The third paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

At contact surfaces of stiffeners, railings, or built up members, any open seam exceeding 6 mils in width that would retain moisture shall be caulked with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II, or other approved material. The sealing compound shall be applied no sooner than 72 hours after the last application of undercoat. The sealing compound shall be allowed to cure as recommended by the manufacturer prior to the pressure rinsing with fresh water and the application of first finish coat. When no finish coats are applied, the sealing compound shall be gray in color.

The fourth paragraph in Section 59-2.12, "Painting," of the Standard Specifications is amended to read:

The dry film thickness of the paint will be measured in place with a calibrated Type 2 magnetic film thickness gauge according to Steel Structure Painting Council Specification SSPC-PA2.

The existing paint systems consist of materials listed in "Existing Highway Facilities" of these special provisions.

CLEANING.--All exposed new metal surfaces and areas of connections to existing steel, except where galvanized, shall be dry blast cleaned and dry spot blast cleaned, respectively, in accordance with the provisions of Surface Preparation Specification No. 10, "Near White Blast Cleaning," of the Steel Structures Painting Council. Blast cleaning shall leave all surfaces with a dense, uniform, angular, anchor pattern of no less than 1 1/2 mils as measured in accordance with ASTM Designation: D 4417.

The areas of connections to existing steel to be dry spot blast cleaned shall consist of, as a minimum: (1) new and existing contact surfaces and member surfaces under bolt heads, nuts or washers of all high-strength bolted connections to existing steel, (2) exposed bare surfaces of existing steel remaining after trimming, cutting, drilling or reaming and (3) all areas of existing steel within a 4-inch radius measured in any direction from the point of application of heat for welding or flame cutting.

Abrasives used for blast cleaning existing steel shall comply with the of Abrasive Specification No. 1, "Mineral and Slag Abrasives," of the Steel Structures Painting Council and shall not contain hazardous material.

A Certificate of Compliance conforming to the provisions in Section 6-1.07, "Certificates of Compliance," of the Standard Specifications and a Material Safety Data Sheet shall be furnished prior to use for each shipment of blast cleaning material for existing steel, except for silica sand.

PAINTING.--All blast cleaned surfaces shall receive a single undercoat consisting of a waterborne inorganic zinc coating conforming to the provisions of AASHTO Designation M 300, Type II, except that the first 3 sentences of Section 4.7, "Primer Field Performance Requirement," and the entire Section 4.7.1 of the AASHTO Specification shall not apply. The inorganic zinc coating shall be listed on the qualified products list which may be obtained from the Transportation Laboratory, (916) 227-7000.

Inorganic zinc coating shall be used within 12 hours of initial mixing.

Application of inorganic zinc coating shall conform to provisions for applying zinc-rich coating in Section 59-2.13, "Application of Zinc-Rich Primer," of the Standard Specifications.

Inorganic zinc coating shall not be applied when the atmospheric or surface temperature is less than 45° F nor more than 100° F nor when the relative humidity exceeds 85 percent.

The single undercoat of inorganic zinc coating shall be applied to the required dry film thickness in 2 or more applications within 4 hours after blast cleaning.

Except where elsewhere specified, the total dry film thickness of all applications of inorganic zinc coating shall be not less than 4 mils nor more than 8 mils.

All areas where mudcracking occurs in the inorganic zinc coating shall be blast cleaned and repainted with inorganic zinc coating to the specified thickness.

Except as approved by the Engineer, a minimum curing time of 72 hours shall be allowed between application of inorganic zinc coating and pressure rinsing with fresh water.

All exposed area of inorganic zinc coating shall be thoroughly rinsed with a pressure system using fresh water and a minimum nozzle pressure of 300 psi. During rinsing, the tip of the pressure nozzle shall be placed between 12 and 18 inches from the surface to be rinsed.

The inorganic zinc coating shall be tested for adhesion and cure. The locations of the tests will be determined by the Engineer. The sequence of the testing operations shall be determined by the Contractor. The testing for adhesion and cure will be performed no sooner than 72 hours after application of the single undercoat of inorganic zinc coating. At the Contractor's expense, satisfactory access shall be provided to allow the Engineer to locate the tests and to test the inorganic zinc coating cure. The inorganic zinc coating shall pass both of the following tests:

The inorganic zinc coating shall have a minimum adhesion to steel of 600 psi when measured at no more than 6 locations per span on each girder in accordance with ASTM Designation: D 4541. The Contractor, at the Contractor's expense, shall: (1) verify compliance with the adhesion requirements, (2) furnish test results to the Engineer, and (3) repair the coating after testing.

The inorganic zinc coating cure will be checked by the Engineer. The inorganic zinc coating shall exhibit a solid, hard and polished metal surface when firmly scraped with the knurled edge of a quarter. Inorganic zinc coating that is powdery, soft or does not exhibit a polished metal surface, as determined by the Engineer, shall be repaired by the Contractor, at the Contractor's expense, by blast cleaning and repainting with inorganic zinc coating to the specified thickness.

All exposed area of inorganic zinc coating shall receive a minimum of 2 finish coats of an exterior grade latex paint supplied by the manufacturer of the inorganic zinc coating.

The first finish coat shall be applied within 48 hours following the pressure rinsing with fresh water.

The finish coat paint shall be formulated for application to inorganic zinc coating and shall conform to the following:

Property	Value	ASTM Designation
Pigment content, percent	24 max.	D 3723
Nonvolatile content, mass percent	49 min.	D 2369
Consistency, KU	75 min. to 90 max.	D 562
Fineness of dispersion, Hegman	6 min.	D 1210
Drying time at 77°F, 50% RH, 4 mil wet film Set to touch, minutes Dry through, hours	30 max. 1 max.	D 1640
Adhesion	4A	D 3359, Procedure A

No visible color change in the finish coats shall occur when tested according to the requirements of ASTM Designation: G 53 using FS 40 UV-B bulbs for a minimum of 38 cycles. The cycle shall be 4 hours of ultraviolet (UV) exposure at 140° F and 4 hours of condensate exposure at 104° F.

The vehicle shall be an acrylic or modified acrylic copolymer with a minimum of necessary additives.

The first finish coat shall be applied in 2 applications. The first application shall consist of a spray applied mist application. The second application shall be applied after the mist application has dried to a set to touch condition. The first finish coat color shall match Federal Standard 595B No. 34272. The total dry film thickness of both applications of the first finish coat shall be not less than 2 mils.

Except as approved by the Engineer, a minimum drying time of 12 hours shall be allowed between finish coats.

The second finish coat color shall match the color of the adjacent existing paint. The total dry film thickness of all applications of the second finish coat shall be not less than 2 mils.

The 2 finish coats shall be applied in 3 or more applications to a total dry film thickness of not less than 4 mils nor more than 8 mils.

The total dry film thickness of all applications of inorganic zinc coating and finish coat paint shall be not less than 8 mils nor more than 14 mils.

MEASUREMENT AND PAYMENT.--Dry spot blast cleaning and undercoat painting of blast cleaned areas of existing surfaces will be measured by the square foot of spot blast cleaned areas, and will be paid for as spot blast clean and paint undercoat.

The contract price paid per square foot for spot blast clean and paint undercoat shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in spot blast cleaning and painting undercoat on the existing surfaces complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

Cleaning and painting structural steel is paid for as specified in "Miscellaneous Metal (Bridge)" of these special provisions.

10-1.28 REINFORCED CONCRETE PIPE

Reinforced concrete pipe shall conform to the provisions in Section 65, "Reinforced Concrete Pipe," of the Standard Specifications and these special provisions.

The compaction required below the pipe spring line for pipe in Method 1 backfill in trench, where the pipe is not within the traveled way or under embankment, shall be 85 percent minimum.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

Portland cement for concrete backfill shall be Type III conforming to the requirements in Section 90-2.01, "Portland Cement," of the Standard Specifications. A Type C accelerating admixture conforming to the requirements of ASTM Designation: C 494 shall be added to the concrete mix for concrete backfill. The admixture shall be used at the rate recommended by the manufacturer of the admixture. The admixture shall not contain chlorides as Cl in excess of one percent by weight as determined by California Test 415.

Full compensation for loading, transporting and disposing of contaminated (hazardous) material, and furnishing, installing and removing impermeable barriers, shall be included in the contract price paid per linear foot for 18" reinforced concrete pipe (hazardous material) and no additional compensation will be allowed therefor.

10-1.29 CORRUGATED METAL PIPE

Corrugated steel pipe culverts shall conform to the provisions in Section 66, "Corrugated Metal Pipe," of the Standard Specifications and these special provisions.

Except as otherwise designated by classification on the plans or in the specifications, joints for culvert and drainage pipes shall conform to the plans or specifications for standard joints.

Corrugated steel pipe shall be fabricated from zinc-coated steel sheet.

Full compensation for loading, transporting and disposing of contaminated (hazardous) material, and furnishing, installing and removing impermeable barriers, shall be included in the contract price paid per linear foot for 6" corrugated steel pipe (.079" thick) (hazardous material) and 18" corrugated steel pipe (.109" thick) (hazardous material) and no additional compensation will be allowed therefor.

10-1.30 OVERSIDE DRAINS

Steel pipe downdrains shall conform to the provisions in Section 69, "Overside Drains," of the Standard Specifications and these special provisions.

Steel pipe downdrains shall be fabricated from zinc-coated steel sheet.

10-1.31 MISCELLANEOUS FACILITIES

Corrugated steel pipe inlet shall conform to the provisions in Section 70, "Miscellaneous Facilities," of the Standard Specifications.

Full compensation for loading, transporting and disposing of contaminated (hazardous) material, and furnishing, installing and removing impermeable barriers, shall be included in the contract price paid per linear foot for 36" corrugated steel pipe inlet (.138" thick) (hazardous material) and no additional compensation will be allowed therefor.

10-1.32 MISCELLANEOUS CONCRETE CONSTRUCTION

Concrete curb, ramp, and gutter shall conform to the provisions in Section 73, "Concrete Curbs and Sidewalks," of the Standard Specifications.

10-1.33 MISCELLANEOUS IRON AND STEEL

Miscellaneous iron and steel shall conform to the provisions in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

The second paragraph in Section 75-1.06, "Measurement," of the Standards Specifications is amended to read:

Scale weights will not be required when miscellaneous iron and steel, miscellaneous bridge metal, miscellaneous metal (restrainer), or pumping plant metal work are designated as final pay items in the Engineer's Estimate.

Cast iron pipe will be measured and paid for by linear foot in the same manner specified for welded steel pipe in Section 70-1.04, "Measurement," and in Section 70-1.05, "Payment," of the Standard Specifications.

Full compensation for loading, transporting and disposing of contaminated (hazardous) material, and furnishing, installing and removing impermeable barriers, shall be included in the contract price paid per linear foot for 6" cast iron pipe (hazardous material) and no additional compensation will be allowed therefor.

Concrete backfill for cast iron pipe shall be constructed in accordance with the requirements in Section 66-1.045, "Concrete Backfill," of the Standard Specifications and will be measured and paid for in accordance with the provisions in Section 66-4, "Measurement and Payment," of the Standard Specifications.

10-1.34 MISCELLANEOUS METAL (BRIDGE)

Miscellaneous metal (bridge) shall conform to the provisions for miscellaneous bridge metal in Section 75, "Miscellaneous Metal," of the Standard Specifications and these special provisions.

Attention is directed to "Welding Quality Control" elsewhere in these special provisions.

Miscellaneous metal (bridge) shall consist of the miscellaneous bridge metal items listed in Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications, and the following:

nuts, bolts, washers and plates that are not paid for in other items of work
angles and channels
6 inch double extra strong pipe and associated threaded rods and nuts
8 inch double extra strong pipe and associated threaded rods and nuts
studs

Unless otherwise specified or shown on the plans, materials shall conform to the specifications of ASTM as listed in the following tabulation with certain modifications and additions as specified:

MATERIAL	SPECIFICATION
Structural steel	ASTM Designation: A 709/A 709M, Grade 36 [250] or A 36/A 36M ^(a)
High strength low alloy columbium vanadium steel	ASTM Designation: A 709/A 709M, Grade 50 [345] or A 572/A 572M, Grade 50 [345] ^(a)
High strength low alloy structural steel	ASTM Designation: A 709/A 709M, Grade 50W [345 W] or A 588/A 588M ^(a)
High-yield strength, quenched and tempered alloy steel plate suitable for welding	ASTM Designation: A 709/A 709M, Grade 100 [690] and Grade 100W [690W] or A 514/A 514M ^(a)
Steel fasteners for general applications: Bolts and studs which include threaded rods and nonheaded anchor bolts Nuts Washers	 ASTM Designation: A 307 or AASHTO Designation: M 314, Grade 36 or 55 ASTM Designation: A 563 including Appendix X1 ^(b,c) ASTM Designation: F 844
High strength steel fasteners: Bolts for structural steel joints Bolts and studs which include threaded rods and nonheaded anchor	 ASTM Designation: A 325 or A 325M ASTM Designation: A 449

bolts, for general applications	
Nuts	ASTM Designation: A 563 including Appendix X1 ^(b) or A 563M including Appendix X1 ^(b,c)
Washers	ASTM Designation: F 436 or F 436M
Direct tension indicators	ASTM Designation: F 959 or F 959M, zinc coated
Carbon steel for forgings, pins and rollers	ASTM Designation: A 668/A 668M, Class D
Alloy steel for forgings	ASTM Designation: A 668/A 668M, Class G
Pin nuts	ASTM Designation: A 36/A 36M
Carbon-steel castings	ASTM Designation: A 27/A 27M, Grade 65-35 [450-240], Class 1
Malleable iron castings	ASTM Designation: A 47, Grade 32510 or A 47M, Grade 22010
Gray iron castings	ASTM Designation: A 48, Class 30B
Carbon steel structural tubing	ASTM Designation: A 500, Grade B or A 501
Steel pipe (Hydrostatic testing will not apply)	ASTM Designation: A 53, Type E or S, Grade B; A 106, Grade B; or A 139, Grade B

Stud connectors	ASTM Designation: A 108 and ANSI/AASHTO/AWS D1.5
<p>(a) Grades that may be substituted for the equivalent ASTM Designation: A 709 steel, at the Contractor's option, subject to the modifications and additions specified and to the requirements of A 709.</p> <p>(b) Nuts made and marked in accordance with the requirements of ASTM Designation: A 194/A 194M, Grade 2H are an acceptable substitution for heavy hex nuts complying with ASTM Designation: A 563, Grade DH. This substitution is permitted, provided that the zinc coating, overtapping, lubrication, rotational capacity requirements and testing of the substituted nuts meet the same requirements as specified for the A 563 nuts, including all supplementary requirements. Proof load testing and stresses required for ASTM A 194 zinc-coated nuts shall be the same as required for ASTM A 194 plain uncoated nuts.</p> <p>(c) All zinc-coated nuts that will be tightened beyond snug or wrench tight shall be furnished with a dry lubricant conforming to Supplementary Requirement S2 in ASTM Designation: A 563.</p>	

Welding shall conform to the requirements of Section 55-3.17, "Welding," of the Standard Specifications and these special provisions.

The third paragraph of Section 55-3.17, "Welding," of the Standard Specifications is amended to read:

The extent of radiographic testing on groove welds shall be in accordance with the requirements in ANSI/AASHTO/AWS D1.5, Subsection 6.7.1.2. In addition, twenty-five percent of all main member tension groove welds, in material in excess of 1/2 inch thickness, shall be ultrasonically tested.

The flat side of all butt welded joints shall not deviate from flatness by more than 3/16 inch in a length of 2 feet centered over the weld joint.

Table 2.2 of ANSI/ AASHTO/AWS D1.5 is superseded by the following table:

Base Metal Thickness of the Thicker Part Joined, in.	Minimum Partial Joint Penetration Groove Weld Size, in.*
Over 1/4 to 1/2 inclusive	3/16
Over 1/2 to 3/4 inclusive	1/4
Over 3/4 to 1 1/2 inclusive	5/16
Over 1 1/2 to 2 1/4 inclusive	3/8
Over 2 1/4 to 6 inclusive	1/2
Over 6	5/8

*Except the weld size need not exceed the thickness of the thinner part.

High-strength bolted connections shall conform to the provisions in Section 55-3.14, "Bolted Connections," of the Standard Specifications and these special provisions.

Paragraphs 1 through 5 of Section 55-3.14, "Bolted Connections," of the Standard Specifications are amended to read:

55-3.14 Bolted Connections.—Bolted connections, unless otherwise shown on the plans or specified in the special provisions, shall be made with high-strength steel fastener assemblies. Fastener assemblies for high-strength connections shall be either 1) a high-strength steel bolt, nut and washer assembly, 2) a tension control bolt assembly, or 3) a high-strength bolt, nut and washer with a direct tension indicator (DTI).

When threaded studs are shown on the plans to be used in high-strength fastener assemblies, these assemblies shall conform to the requirements specified herein for high-strength fastener assemblies.

Bolted connections using high-strength fastener assemblies shall conform to the "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts," approved by the Research Council on Structural Connections of the Engineering Foundation (RCSC Specification), and the requirements of these special provisions.

When reference is made to the RCSC Specification, the "Allowable Stress Design" version shall be used when allowable stress design is shown on the plans and the "Load and Resistance Factor Design" version shall be used when load and resistance factor design is shown on the plans.

All connections made with high-strength fastener assemblies shall be tensioned and inspected after tensioning, whether classified as a slip critical or bearing type connection, unless otherwise designated on the plans.

All high-strength bolts shall be installed with a hardened washer under the nut or bolt head, whichever is the element turned in tightening. Nuts shall be located, wherever practicable, on the side of the member that will not be visible from the traveled way. Nuts for bolts that will be partially embedded in concrete shall be located on the side of the member that will be encased in concrete.

All fastener assemblies used in any one joint of a high-strength bolted connection shall be from the same rotational capacity lot.

The Contractor shall provide, calibrate and maintain all equipment and tools necessary for the preliminary testing, installation and inspection of all fasteners.

Bolt tension measuring devices and torque wrenches shall be calibrated within one year prior to first being used on the job, and a minimum of once each year thereafter. This calibration shall be done by a qualified independent laboratory or authorized warranty repair and calibration center recognized by the tool manufacturer. Bolt tension measuring devices shall be calibrated, to within one percent of the actual tension value, with a minimum of 4 verification readings evenly spaced over a range of 20 to 80 percent of full scale. All torque wrenches shall have either a dial gage or digital read-out. Torque wrenches shall be calibrated, to within 2 percent of the actual torque value, with a minimum of 4 verification readings evenly spaced over a range of 20 to 100 percent of full scale. All test equipment used for certification and calibration standards shall be traceable to the National Institute of Standards and Technology.

Prior to the use of bolt tension measuring devices or torque wrenches, the Contractor shall furnish to the Engineer certificates of calibration with plots of verification readings for each device or wrench.

In addition to the submittals required in Section 55-1.03, "Inspection," of the Standard Specifications, the Contractor shall furnish certified test reports of tests on fastener components and fastener assemblies performed prior to shipment to the job-site. Certified test reports for fastener components and fastener assemblies shall be furnished to the Engineer prior to use of the fastener assembly. The certified test reports shall include the rotational capacity lot numbers for fastener assemblies supplied and test reports specified in the "Certification," "Report," "Number of Tests and Retests," and "Certification and Test Report" sections in the appropriate ASTM specifications for the fastener components. In addition, certified test reports as specified in the "Certification and Test Report" section of ASTM Designation: A 325 shall be provided for any type of bolt used in a fastener assembly.

Section 55-3.14, "Bolted Connections," of the Standard Specifications is amended by adding the following paragraphs:

55-3.14B Surface Preparation.—Contact surfaces of all high-strength bolted connections shall be cleaned and coated before assembly in accordance with the provisions for cleaning and painting structural steel in the special provisions.

55-3.14C Installation.—If water soluble lubricants are used on nuts, fastener installation will not be permitted when surface moisture is present at any high-strength bolted connection. The Engineer may require the Contractor to perform additional installation tension tests before fastener installation and tensioning is performed at any high-strength bolted connection during inclement weather.

Bolts shall be tightened to the required tension by use of a calibrated power wrench, a calibrated manual torque wrench, the turn-of-nut method, or by using mechanically zinc coated direct tension indicators.

The threaded ends of fastener assemblies, where first full formed threads are present, shall be at least flush with, but not extend more than 1/4-inch beyond, the outer face of the nut. A maximum of one additional hardened washer may be installed under the non-turning element of the fastener assembly. The threaded ends of studs, rods and anchor bolts, shall extend at least 1/8-inch beyond the outer face of the nut.

Larger bolts, having diameters up to 1/4-inch greater than the diameter of the bolt shown on the plans, may be used if approved by the Engineer provided that spacing and edge distance requirements for the larger bolt are met and the net section is adequate.

When direct tension indicators are used, one DTI shall be installed under each bolt head with the DTI protrusions contacting the bearing surface of the bolt head. To tension the bolt, the bolt head shall be held stationary and the nut turned. Unless otherwise specified, manufacturer's installation procedures shall be followed. Each bolt shall be tensioned in at least 2 tightening stages until at least 50% of the gaps on each DTI are greater than zero and less than 0.005 inch. Complete crushing of all DTI protrusions (0 gaps) is not permitted on any given DTI and will be cause for rejection.

Tension control bolts shall have a splined end extending beyond the threaded portion of the bolt that shears off after the specified minimum bolt tension has been attained. During installation, the torque required to turn the nut on the tension control bolt shall be counterbalanced by the torsion shear resistance of the splined end of the bolt. The same type of bolt head and head orientation shall be used within any one high-strength bolted connection.

55-3.14D Rotational Capacity Testing Prior to Shipment to Job Site.—Rotational capacity tests shall be performed on all fastener assemblies prior to shipment to the job-site. Galvanized assemblies shall be tested as galvanized. One washer shall be used under each nut for all tests.

Each combination of bolt production lot, nut lot and washer lot shall be tested as an assembly.

A rotational capacity lot number shall be assigned to each combination of lots tested. Each shipping unit of fastener assemblies shall be plainly marked with the rotational capacity lot number.

Two fastener assemblies from each rotational capacity lot shall be tested.

The following equipment, procedure and acceptance criteria shall be used to perform rotational capacity tests on, and determine acceptance of long bolts. Long bolts are fasteners that can achieve full nut thread engagement when installed in a bolt tension measuring device.

Long Bolt Test Equipment:

1. Calibrated bolt tension measuring device with adequate tension capacity for the bolts being tested.
2. Calibrated dial or digital torque wrench. A torque multiplier may be required for large diameter bolts.
3. Washers having an inside diameter no more than 1/16 inch greater than the nominal diameter of the bolt to be tested. Spacers with the same inside diameter and equal or larger outside diameter as the washers may also be required.
4. Steel beam or member, such as a girder flange or cross frame, to which the bolt tension measuring device will be attached. The device must be accessible from the ground.

Long Bolt Test Procedure:

1. Measure the bolt length. The bolt length is the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Insert the bolt into the bolt tension measuring device and install the required number of washers, and any additional spacers as needed, directly beneath the nut to produce the thread stickout measured in Step 2.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug tension shall not be less than the Table A value but may exceed the Table A value by a maximum of 2 kips.

Table A

Fastener Assembly Tension Values to Approximate Snug-Tight Condition	
Bolt Diameter (inch)	Snug Tension (kips)
1/2	1
5/8	2
3/4	3
7/8	4
1	5
1 1/8	6
1 1/4	7
1 3/8	9
1 1/2	10

5. Match-mark the assembly by placing aligning marks on one corner of the nut, across the flat on the end of the bolt, and a heavy reference line on the face plate of the bolt tension measuring device. Place an additional mark on the outside of the socket that lines up with the mark on the nut corner so that it is visible while turning the nut. Make an additional small mark on the face plate, either 2/3 of a turn, one turn, or 1 1/3 turn clockwise from the heavy reference line, depending on the bolt length being tested as shown in Table B.

Table B

Required Nut Rotation for Rotational Capacity Tests ^(a,b)	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3
Greater than 4 bolt diameters but no more than 8 bolt diameters	1
Greater than 8 bolt diameters ^(c)	1 1/3
<p>(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees; for bolts installed by 2/3 turn and more, the tolerance shall be plus or minus 45 degrees.</p> <p>(b) Applicable only to connections in which all material within grip of the bolt is steel.</p> <p>(c) When bolt lengths exceed 12 diameters, the required rotation must be determined by actual tests in a suitable tension device simulating the actual conditions.</p>	

6. Tension the bolt by turning the nut to achieve the applicable minimum tension value listed in Table C. After reaching this tension, record the moving torque, in foot-pounds, required to turn the nut, and also record the corresponding bolt tension value in pounds. Torque must be measured with the nut in motion. Calculate the value, T , $T = [(\text{the measured tension in pounds}) \times (\text{the bolt diameter in inches}) / 48]$.

Table C

Minimum Tension Values for Fastener Assemblies	
Bolt Diameter (inch)	Minimum Tension (kips)
1/2	12
5/8	19
3/4	28
7/8	39
1	51
1 1/8	56
1 1/4	71
1 3/8	85
1 1/2	103

7. Tension the nut further until the rotation listed in Table B is reached. The rotation is measured from the heavy reference line made on the face plate after the bolt was snug-tight. Record this bolt tension.
8. Loosen and remove the nut and examine the threads on both the nut and bolt.

Long Bolt Acceptance Criteria:

An assembly must pass all of the following requirements to be acceptable: 1) the measured moving torque (Step 6) must be less than or equal to the calculated torque value, T (Step 6), 2) the bolt tension measured in Step 7 must be greater than or equal to the applicable turn test tension value listed in Table D, 3) the nut must be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 4) the bolt does not shear from torsion or fail during the test and 5) the assembly does not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head will not be considered a failure. Both assemblies tested from one rotational capacity lot must pass for the rotational capacity lot to be acceptable.

Table D

Turn Test Tension Values	
Bolt Diameter (inch)	Turn Test Tension (kips)
1/2	14
5/8	22
3/4	32
7/8	45
1	59
1 1/8	64
1 1/4	82
1 3/8	98
1 1/2	118

The following equipment, procedure and acceptance criteria shall be used to perform rotational capacity tests on and determine acceptance of short bolts. Short bolts are fasteners that cannot achieve full nut thread engagement when installed in a bolt tension measuring device.

Short Bolt Test Equipment:

1. Calibrated dial or digital torque wrench. A torque multiplier may be required for large diameter bolts.
2. Spud wrench or equivalent.
3. Washers having an inside diameter no more than 1/16 inch greater than the nominal diameter of the bolt to be tested. Spacers with the same inside diameter and equal or larger outside diameter as the washers may also be required.
4. Steel plate or girder with a hole to install bolt. The hole size shall be 1/16 inch greater than the nominal diameter of the bolt to be tested. Any girder having an appropriately sized bolt hole and plate

thickness with washers, and any additional spacers as needed, which will provide the proper number of threads within the grip, as required in Step 2 below, may be used.

Short Bolt Test Procedure:

1. Measure the bolt length. The bolt length is the distance from the end of the threaded portion of the shank to the underside of the bolt head.
2. Install the nut on the bolt so that 3 to 5 full threads of the bolt are located between the bearing face of the nut and the underside of the bolt head. Measure and record the thread stickout of the bolt. Thread stickout is determined by measuring the distance from the outer face of the nut to the end of the threaded portion of the shank.
3. Install the bolt into a hole on the plate or girder and install the required number of washers, and any additional spacers as needed, between the bearing face of the nut and the underside of the bolt head to produce the thread stickout measured in Step 2.
4. Tighten the nut using a hand wrench to a snug-tight condition. The snug condition shall be the full manual effort applied to the end of a 12-inch long wrench. This applied torque shall not exceed 20% of the maximum allowable torque in Table E.

Table E

Maximum Allowable Torque for Fastener Assemblies	
Bolt Diameter (inch)	Torque (ft-lbs)
1/2	145
5/8	285
3/4	500
7/8	820
1	1220
1 1/8	1500
1 1/4	2130
1 3/8	2800
1 1/2	3700

5. Match-mark the assembly by placing aligning marks on one corner of the nut, across the flat on the end of the bolt, and a heavy reference line on the steel plate or girder. Place an additional mark on the outside of the socket that lines up with the mark on the nut corner so that it is visible while turning the nut. Make two additional small marks on the steel plate or girder, one 1/3 of a turn and one 2/3 of a turn clockwise from the heavy reference line on the steel plate or girder.
6. Using the torque wrench, tighten the nut to the rotation value listed in Table F. The rotation is measured from the heavy reference line described in Step 5 made after the bolt was snug-tight. A second wrench must be used to prevent rotation of the bolt head during tightening. Measure and record the moving torque after this rotation has been reached. The torque must be measured with the nut in motion.

Table F

Nut Rotation Required for Turn-of-Nut Installation (a,b)	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	1/3
(a) Nut rotation is relative to bolt, regardless of the element (nut or bolt) being turned. For bolts installed by 1/2 turn and less, the tolerance shall be plus or minus 30 degrees.	
(b) Applicable only to connections in which all material within grip of the bolt is steel.	

7. Tighten the nut further to the 2/3 turn mark as indicated in Table G. The rotation is measured from the heavy reference line made on the plate or girder when the bolt was snug-tight.

Table G

Required Nut Rotation for Rotational Capacity Test	
Bolt Length (measured in Step 1)	Required Rotation (turn)
4 bolt diameters or less	2/3

8. Loosen and remove the nut and examine the threads on both the nut and bolt.

Short Bolt Acceptance Criteria:

An assembly must pass all of the following requirements to be acceptable: 1) the measured moving torque from Step 6 must be less than or equal to the maximum allowable torque from Table E, 2) the nut must be able to be removed from the bolt without signs of thread stripping or galling after the required rotation in Step 7 has been achieved, 3) the bolt does not shear from torsion or fail during the test and 4) the assembly does not seize before the final rotation in Step 7 is reached. Elongation of the bolt in the threaded region between the bearing face of the nut and the underside of the bolt head will not be considered a failure. Both assemblies tested from one rotational capacity lot must pass for the rotational capacity lot to be acceptable.

55-3.14E Installation Tension Testing and Rotational Capacity Testing After Arrival to Job Site.—

Installation tension tests and rotational capacity tests on fastener assemblies shall be performed by the Contractor prior to acceptance or installation, and after shipment of the fastener assemblies to the job-site. The installation tension tests and rotational capacity tests shall be performed at the job-site, in the presence of the Engineer, on each rotational capacity lot of fastener assemblies.

Installation tension tests shall be performed on 3 representative fastener assemblies in accordance with Section 8, "Installation and Tightening," of the RCSC Specification. For short bolts, Section 8(d), "Joint Assembly and Tightening of Slip-Critical and Direct Tension Connections," of the RCSC Specification shall be replaced by the "Pre-Installation Testing Procedures," of the "Structural Bolting Handbook," published by the Steel Structures Technology Center, Incorporated (SBH).

The rotational capacity tests shall be performed in accordance with the procedures for rotational capacity tests in "Rotational Capacity Testing Prior to Shipment to Job Site" of these specifications.

At the Contractor's expense, additional installation tension tests and rotational capacity tests shall be performed by the Contractor on each rotational capacity lot, in the presence of the Engineer, if 1) any fastener is not used within 3 months after shipment to the jobsite, 2) fasteners are improperly handled, stored, or subjected to inclement weather prior to final tightening, or 3) if significant changes are noted in original surface condition of threads, washers or nut lubricant.

Failure of a job-site installation tension test or a rotational capacity test will be cause for rejection of all fasteners represented by the rotational capacity lot.

When DTIs are used, installation verification tests shall be done using a bolt tension calibration device. Bolts shall be tensioned to a value 5% greater than the minimum required bolt tension and all gaps shall be checked with a tapered feeler gauge for refusal. Complete entry of a 0.005-inch feeler gauge shall occur in at least half of all the gaps for a DTI to be acceptable.

55-3.14F Inspection.—For all types of fastener assemblies, at least 10%, but no fewer than 2 bolts in each high-strength bolted connection shall be inspected after tensioning in accordance with the requirements of Section 9, "Inspection," of the RCSC Specification. The Contractor shall be responsible for determining the job inspecting torque as specified in Section 9(b), "Arbitration Inspection," of the RCSC Specification. The procedure described for determining arbitration torque in steps 1 through 9 of the "Arbitration of Disputes Inspection Torque Method-Short Bolts," section of the SBH, shall replace Section 9(b)(2) of the RCSC Specification for determining the job inspecting torque for short bolts. Bolt tension shall be checked at locations selected by the Engineer. All work required to perform such inspection shall be done by the Contractor in the presence of the Engineer and in such a manner that the Engineer can read the torque wrench gage or access the DTI gaps during checking.

Except for galvanized surfaces, new metal contact surfaces within the grip of all high-strength bolted connections shall be cleaned and coated before assembly in accordance with the provisions for cleaning and painting structural steel of these special provisions.

Prior to painting, the perimeter around all DTI gaps shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and have a minimum thickness of 50 mils.

The sheared end of each tension control bolt shall be completely sealed with non-silicone type sealing compound conforming to the provisions in Federal Specification TT-S-230, Type II. The sealant shall be gray in color and shall have a minimum thickness of 50 mils. The sealant shall be applied to a clean sheared surface on the same day that the splined end is sheared off.

Section 55-3.14B, "Surface Preparation," as specified herein shall not apply to galvanized surfaces.

Except where waterborne inorganic zinc coating with finish coats is specified, fastener assemblies, and other bolts attached to structural steel with nuts and washers shall be zinc-coated. Tension control bolt assemblies shall be zinc-coated by the mechanically deposited process.

Double extra strong steel pipe shall conform to the requirements of ASTM Designation: A53, Grade B.

Grout for filling the space between the 9" cored hole and the double extra strong pipe shall conform to the requirements for grout in section 51-1.13, "Bonding," of the Standard Specifications.

The Contractor shall submit to the Engineer working drawings and design calculations for the isolation joints in conformance with the requirements for working drawings for steel structures as specified in Section 55, "Steel Structures," of the Standard Specifications and these special provisions.

The first paragraph in Section 55-1.02, "Drawings," of the Standard Specifications is amended to read:

55-1.02 Drawings.—The Contractor shall submit working drawings for structural steel to the Office of Structure Design, Documents Unit, P.O. Box 942874, Mail Stop 9, Sacramento, California 94274-0001 (1801 30th Street, Sacramento, CA 95816), telephone (916) 227-8230, for approval in accordance with the provisions in Section 5-1.02, "Plans and Working Drawings." For initial review, 6 sets of the drawings shall be submitted for highway bridges and 10 sets shall be submitted for railroad bridges. After review, between 6 and 12 sets, as requested by the Engineer, shall be submitted to the Office for final approval and for use during construction.

Paragraphs 7 through 9 of Section 55-1.02, "Drawings," of the Standard Specifications are amended to read:

At the completion of each structure on the contract, one set of reduced prints on 20 pound (minimum) bond paper, 11 inches by 17 inches in size, of the corrected original tracings of all working drawings for each structure shall be furnished to the Engineer. Reduced prints that are common to more than one structure shall be submitted for each structure. An index prepared specifically for the drawings for each structure containing sheet numbers and titles shall be included on the first reduced print in the set for each structure. Reduced prints for each structure shall be arranged in the order of drawing numbers shown in the index.

The edge of the corrected original tracing image shall be clearly visible and visually parallel with the edges of the page. A clear, legible symbol shall be provided on the upper left side of each page to show the amount of reduction and a horizontal and vertical scale shall be provided on each reduced print to facilitate enlargement to original scale.

For railroad bridges, in addition to the reduced prints of the working drawings, the Contractor shall furnish to the Engineer one set of working drawings consisting of either ink tracings on cloth, ink tracings on polyester base drafting film, silver sensitized cloth duplicate tracings, or silver sensitized polyester based reproduction films with matte surface on both sides.

Where galvanized members are field welded, the zinc coating shall be removed from said member by dry spot blast cleaning all affected areas within 4 inches of the point of application of heat for welding as specified for cleaning existing structural steel in "Clean and Paint Structural Steel," of these special provisions.

Where new miscellaneous metal is welded to existing steel, any adhering concrete shall be removed from the steel surface within the welded area and at the contact surfaces of the new and existing steel.

Areas where zinc coating has been removed for welding shall be painted with zinc-rich primer as specified for repairing damaged galvanized surfaces in Section 75-1.05, "Galvanizing," of the Standard Specifications.

Plates and associated nuts, bolts and washers at the new elastomeric bearing pad locations shall not be galvanized. Said steel components shall be cleaned and painted as specified in "Clean and Paint Structural Steel," of these special provisions.

Elastomeric pads shown on the plans at the isolation joints shall conform to the provisions for elastomeric bearing pads as specified in Section 51-1.12H, "Elastomeric Bearing Pads," of the Standard Specifications except that the pads may consist of all elastomer regardless of thickness. Reinforcement in the pads will not be required.

An approved thread locking system, consisting of a cleaner, primer and anaerobic adhesive, shall be applied where shown on the plans. Lubricants and foreign materials shall be removed from the threaded areas of both parts using the cleaner and small wire brush. The primer shall be applied to cover the threaded areas of both parts. The anaerobic adhesive shall be applied to fill the male threads in the area of the final position of the nut. The nut shall be installed at the location or to the torque shown on the plans, and an additional fillet of anaerobic adhesive shall be applied completely around the exposed junctions of the nut and male part. Full compensation for furnishing and applying the thread locking system shall be considered as included in the contract price paid for the item of work requiring the system and no separate payment will be made therefor.

For drainage piping 8 inches in diameter or less, which is: (1) enclosed in a box girder cell and exposed for a length not greater than 20 feet, or (2) encased in concrete, the Contractor shall have the option of substituting polyvinyl chloride (PVC) plastic pipe, with the same diameter and minimum bend radius as shown on the plans, for welded steel pipe. The polyvinyl chloride (PVC) plastic pipe shall be Schedule 40 conforming to the requirements of ASTM Designation: D 1785. If polyvinyl chloride (PVC) plastic pipe is substituted for welded steel pipe, the quantity of drainage piping will be computed on the basis of the dimensions and details shown on the plans and no change in the quantities to be paid for will be made because of the use by the Contractor of polyvinyl chloride (PVC) plastic pipe.

The brass cover at the clean out pipe shall be commercial quality.

The third subparagraph of the eleventh paragraph of Section 75-1.03, "Miscellaneous Bridge Metal," of the Standard Specifications is amended to read:

Cast-in-place inserts shall be the ferrule loop type.

All metal parts of anchorage devices shall be fabricated from stainless steel conforming to the requirements of ASTM Designation: A 276, Type 304 or 316.

The second paragraph in Section 75-1.06, "Measurement," of the Standards Specifications is amended to read:

Scale weights will not be required when miscellaneous iron and steel, miscellaneous bridge metal, miscellaneous metal (restrainer), or pumping plant metal work are designated as final pay items in the Engineer's Estimate.

The brass cover at the clean out pipe will be measured and paid for as miscellaneous metal (bridge).

Full compensation for reinstalling drainage pipe shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no separate payment will be allowed therefor.

Full compensation for reinstalling bearing plates shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no additional compensation will be allowed therefor.

Full compensation for removing zinc coating at welds and painting said areas with zinc-rich primer shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no separate payment will be allowed therefor.

Full compensation for cleaning and painting miscellaneous metal components shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no separate payment will be allowed therefor.

Full compensation for elastomeric pads at the isolation joints shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no separate payment will be allowed therefor.

Full compensation for resetting bridge railing shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no separate payment will be allowed therefor.

Full compensation for filling the space between the 9" cored hole and the double extra strong pipe shall be considered as included in the contract price paid per pound for miscellaneous metal (bridge) and no additional compensation will be allowed therefor.

10-1.35 MISCELLANEOUS METAL (RESTRAINER-CABLE TYPE)

Miscellaneous metal (restrainer-cable type) shall conform to the provisions for bridge joint restrainer units in Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications and these special provisions.

New concrete adjacent to restrainers shall be placed prior to installing restrainers.

Loose dirt and dust shall be washed from existing contact surfaces of high strength bolted connections without disturbing the existing paint. Full compensation for washing loose dirt and dust from existing contact surfaces of high strength bolted connections will be considered as included in the contract price paid for the item of work requiring the washing and no separate payment will be made therefor.

Cleaning and painting of existing contact surfaces of high strength bolted connections that contain rust, loose paint or other foreign substances, except loose dirt and dust, will be considered as extra work as specified in Section 4-1.03D, "Extra Work," of the Standard Specifications. Cost of repair of damage to existing paint caused by the Contractor's operations shall be borne by the Contractor.

The seventh subparagraph of the fourth paragraph of Section 75-1.035, "Bridge Joint Restrainer Units," of the Standard Specifications is amended to read:

The following materials shall be furnished to the Engineer at the manufacturer's plant:

1. One sample cable assembly, consisting of a cable properly fitted with swaged fitting and right hand thread stud at both ends, 3 feet in total length, for each 200 cable assemblies or fraction thereof produced.
2. One turnbuckle fitted with an 8-inch stud at each end for each 200 turnbuckles or fraction thereof produced.
3. One percent of the cable yield indicators, but no fewer than 8, produced from each mill heat.
4. Two disc springs of each size produced from each mill heat.

The Contractor shall notify the Engineer, in writing, 2 days prior to tightening and setting of cable restrainer units.

Miscellaneous metal (restrainer-cable type) will be measured and paid for by the pound in the same manner specified for miscellaneous metal (restrainer) in Sections 75-1.06, "Measurement," and 75-1.07, "Payment," of the Standard Specifications.

Full compensation for reusing restrainer plates shall be considered as included in the contract price paid per pound for miscellaneous metal (restrainer-cable type) and no additional compensation will be allowed therefor.

10-1.36 CHAIN LINK FENCE AND GATE

Chain link fence and gate shall be Type CL-6 and shall conform to the provisions in Section 80, "Fences," of the Standard Specifications and these special provisions.

Used materials may be used providing such used materials are good, sound, and are suitable for the purpose intended.

Materials may be commercial quality providing the dimensions and sizes of said materials are equal to, or greater than, the dimensions and sizes shown on the plans or specified by the specifications.

Posts shall be either metal or wood at the Contractor's option.

Galvanizing and painting of steel items will not be required.

Treating wood with wood preservatives will not be required.

Concrete footings for metal posts will not be required.

10-1.37 CONCRETE BARRIER

Concrete barriers shall conform to the provisions in Section 83-2, "Barriers," of the Standard Specifications and these special provisions.

Concrete barrier Type 60 series shall conform to specifications for concrete barrier Type 50 series.

The requirements of the third paragraph in Section 83-2.02D(4), "Finishing," of the Standard Specifications shall not apply.

10-1.38 CRASH CUSHION, FRANGIBLE CARTRIDGE

Frangible cartridge crash cushions shall be furnished and installed as shown on the plans, and as specified in the Standard Specifications and these special provisions.

Crash cushions shall be installed at the following location:

Treasure Island exit, lower deck of San Francisco-Oakland Bay Bridge, at LT line
Station 154+90.

The crash cushion shall be a guard rail energy absorbing terminal type, Hi-Dro Sandwich System Model No. 111307S6S, as made by Energy Absorption Systems, Inc., or equal, and shall include all the items listed for "Crash Cushion" shown on the plans.

Arrangements have been made to insure that any successful bidder can obtain the Hi-Dro Sandwich System type crash cushion from the following source:

Manufacturer:	Distributors
Energy Absorption Systems, Inc. One East Wacker Drive Chicago, IL 60601-2076 Telephone (312) 467-6750	Energy Absorption Systems, Inc. P.O. Box 3333-#291 Encinitas, CA 92024 Telephone (619) 438-7887 FAX (619) 438-7848
	Energy Absorption Systems, Inc. Customer Service Department One East Wacker Drive Chicago, IL 60601-2076 Telephone (800) 255-3240 FAX (312) 467-0201

The price quoted by the manufacturer for the above Model No. 111307S6S, FOB Pell City, Alabama is \$15,455, not including sales tax.

The above price will be firm for all orders placed on or before June 30, 1998, provided delivery is accepted within 90 days after the order is placed.

High strength bolts and nuts for guard rail connections shall conform to ASTM Designation: A 325. Plate washers used for such connections shall be commercial quality. Bolts, nuts and plate washers shall be galvanized in accordance with the provisions in Section 75-1.05, "Galvanizing," of the Standard Specifications.

Concrete anchorage devices used for attaching the crash cushion to the concrete pad shall be limited to those which have been proven satisfactory for such application by previous testing.

The crash cushion shall be installed in accordance with the manufacturer's recommendations.

The concrete pad and backup block shall conform to the provisions in Section 51, "Concrete Structures," and Section 52, "Reinforcement," of the Standard Specifications and these special provisions.

A Type R marker panel shall be attached to the front of the crash cushion as shown on the plans. The marker panel shall be firmly fastened to the crash cushion with commercial quality hardware or by other methods approved by the Engineer.

The Contractor shall furnish to the Engineer one copy of the manufacturer's plan and parts list for each model installed.

The Contractor shall provide the Engineer with the manufacturer's Certificate of Compliance in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications. Said certificate shall certify that the crash cushions comply with the contract plans and specifications, conform to the prequalified design and material requirements, and were manufactured in accordance with the approved quality control program.

Hi-Dro Sandwich System crash cushions will be measured and paid for by the unit as crash cushion, frangible cartridge, of the types shown in the Engineer's Estimate. The quantity of each type of crash cushion shown in the Engineer's Estimate will be determined from actual count in place in the completed work.

The contract unit price paid for crash cushion, frangible cartridge, shall include full compensation for furnishing all labor, materials (including anchor bolts, nuts, washers and marker panels), tools, equipment, and incidentals, and for doing all work involved in furnishing and installing the crash cushion, complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.

10-1.39 THERMOPLASTIC TRAFFIC STRIPES

Thermoplastic traffic stripes (traffic lines) shall conform to the provisions in Sections 84-1, "General," and 84-2, "Thermoplastic Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

The State Specification No. for glass beads in Section 84-2.02, "Materials," of the Standard Specifications is amended to read "8010-21C-22 (Type II)."

At the option of the Contractor, permanent striping tape as specified in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions, may be placed instead of the thermoplastic traffic stripes specified herein, except that STAMARK Brand Pavement Tape, Bisymmetric 1.75 Grade, manufactured by the 3M Company, shall not be used. Pavement tape, if used, shall be installed in accordance with the manufacturer's specifications. If pavement tape is placed instead of thermoplastic traffic stripes, the pavement tape will be measured and paid for as thermoplastic traffic stripe.

10-1.40 PAINT TRAFFIC STRIPES

Painting traffic stripes (traffic lines) shall conform to the provisions in Sections 84-1, "General," and 84-3, "Painted Traffic Stripes and Pavement Markings," of the Standard Specifications and these special provisions.

The State Specification No. for glass beads in Section 84-3.02, "Materials," of the Standard Specifications is amended to read "8010-21C-22 (Type II)."

At the option of the Contractor, permanent striping tape as specified in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions, may be placed instead of the painted traffic stripes specified herein, except that STAMARK Brand Pavement Tape, Bisymmetric 1.75 Grade, manufactured by the 3M Company, shall not be used. Pavement tape, if used, shall be installed in accordance with the manufacturer's specifications. If pavement tape is placed instead of painted traffic stripes, the pavement tape will be measured and paid for as paint traffic stripe of the number of coats designated in the Engineer's Estimate.

10-1.41 PAVEMENT MARKERS

Pavement markers shall conform to the provisions in Section 85, "Pavement Markers," of the Standard Specifications and these special provisions.

The second paragraph in Section 85-1.02, "Type of Markers," of the Standard Specifications shall not apply.

Certificates of Compliance shall be furnished for pavement markers as specified in "Prequalified and Tested Signing and Delineation Materials" elsewhere in these special provisions.

Attention is directed to "Traffic Control System For Lane Closure" elsewhere in these special provisions regarding the use of moving lane closures during placement of pavement markers with bituminous adhesive.

SECTION 10-2. (BLANK)

SECTION 10-3. ELECTRICAL FACILITIES (SEISMIC RETROFIT) AND ELECTRICAL SYSTEMS

10-3.01 DESCRIPTION

Electrical facilities (seismic retrofit) shall conform to the provisions in Section 86, "Signals, Lighting and Electrical Systems," of the Standard Specifications and these special provisions.

10-3.02 COST BREAK-DOWN

The Contractor shall furnish to the Engineer a cost break-down for each contract lump sum item of work described in this Section 10-3.

The Contractor shall determine the quantities required to complete the work shown on the plans. The quantities and values shall be included in the cost break-down submitted to the Engineer for approval. The Contractor shall be responsible for the accuracy of the quantities and values used in the cost break-down submitted for approval.

No adjustment in compensation will be made in the contract lump sum prices paid for the various electrical work items due to any differences between the quantities shown in the cost break-down furnished by the Contractor and the quantities required to complete the work as shown on the plans and as specified in these special provisions.

The sum of the amounts for the units of work listed in the cost break-down for electrical work shall be equal to the contract lump sum price bid for the work. Overhead and profit shall be included in each individual unit listed in the cost break-down, however, costs for traffic control system shall not be included. Bond premium, temporary construction facilities, plant and other items will not be paid for under the various electrical work items and shall be included in the mobilization bid item for the entire project.

The cost break-down shall be submitted to the Engineer for approval within 15 days after the contract has been approved. The cost break-down shall be approved, in writing, by the Engineer before any partial payment for the items of electrical work will be made.

At the Engineer's discretion the approved cost break-down may be used to determine partial payments during the progress of the work and as the basis of calculating the adjustment in compensation for the item or items of electrical work due to changes ordered by the Engineer. When an ordered change increases or decreases the quantities of an approved cost break-down, the adjustment in compensation may be determined at the Engineer's discretion in the same manner specified for increases and decreases in the quantity of a contract item of work in accordance with Section 4-1.03B, "Increased or Decreased Quantities," of the Standard Specifications.

The cost breakdown shall, as a minimum, include the following items:

- Conduit - list by each size and installation method.
- Junction boxes and wiring troughs - each type and size.
- Conductors and cables - each size and type.
- Channel struts and brackets - each size and type.

Terminal blocks- each type.

10-3.03 CONDUIT

Conduit to be installed underground shall be the rigid steel or rigid non-metallic type unless otherwise specified. Installation of PVC-coated galvanized rigid steel conduit, galvanized rigid steel conduit, threaded couplings, conduit bodies and elbows as specified elsewhere in these special provisions shall be per manufacturer recommendation.

The conduit in a foundation and between a foundation and the nearest pull box shall be the rigid steel type.

When a standard coupling cannot be used for coupling metal type conduit, a UL listed threaded union coupling, as specified in the third paragraph in Section 86-2.05C, "Installation," of the Standard Specifications, or a concrete-tight split coupling or concrete-tight set screw coupling shall be used.

After conductors have been installed, the ends of conduits terminating in junction boxes and pull boxes shall be sealed with an approved type of sealing compound.

Pull ropes for use when installing cables in rigid non-metallic conduit shall consist of a flat, woven, lubricated, soft-fiber polyester tape with a minimum tensile strength of 1,800 pounds and shall have printed sequential measurement markings at least every 3 feet.

At the option of the Contractor, the final 2 feet of conduit entering a pull box in a reinforced concrete structure may be the liquidtight flexible metal type.

LIQUIDTIGHT FLEXIBLE METAL (LTFM) CONDUIT.--The liquidtight flexible metal conduit shall conform to Section 86-2.05A, Item 4 of the Standard Specifications for liquidtight flexible metal conduit.

GALVANIZED RIGID STEEL (GRS) CONDUIT, THREADED COUPLINGS, AND ELBOWS.--The galvanized rigid steel conduit, threaded couplings, and elbows shall conform to the following requirements:

1. The conduit, threaded couplings, and elbows shall conform to Federal Specification WW-C-581E, UL Standard No. 6, and ANSI Specification C80.1. The conduit, threaded couplings, and elbows zinc surfaces shall remain intact and undistributed on both the inside and outside throughout the preparation and application processing.
2. The conduit, threaded couplings, and elbows shall be hot dipped galvanized inside and out after fabrication with hot dipped galvanized threads. The zinc coating for conduit, threaded couplings, and elbows will be tested in accordance with ASTM Designation: A239.
3. The hot dipped galvanized threads for conduit and elbows shall be coated with urethane.
4. The hot dipped galvanized threads for threaded couplings shall have an urethane coating of a nominal thickness of 0.002 inches (2 mils).
5. The threaded couplings interior shall have an urethane coating of a nominal thickness of 0.002 inches (2 mils).
6. The conduit shall be bendable without damage.

POLYVINYL CHLORIDE (PVC) COATED GALVANIZED RIGID STEEL (GRS) CONDUIT, THREADED COUPLINGS, AND ELBOWS.--The PVC-coated galvanized rigid steel conduit, threaded couplings and elbows shall conform to the galvanized rigid steel conduit, threaded couplings and elbows as specified elsewhere in these special provisions with the following additional requirements:

1. All PVC coated GRS conduit, threaded couplings and elbows shall conform to NEMA Standard No. RN-1. The bond between the coatings and the metal shall be greater than the tensile strength of the coatings.
2. All PVC coated GRS threaded couplings exterior shall have an urethane coating of a nominal thickness of 0.002 inches (2 mils) before the PVC coating is applied.
3. All PVC coated GRS conduit, threaded couplings and elbows shall have an exterior PVC coating of a minimum thickness of 0.040 inches (40 mils) applied by dipping in liquid plastisol.
4. All PVC coated GRS threaded couplings shall have longitudinal ribs to enhance installation.
5. All hubs on PVC coated GRS threaded couplings shall have a PVC sleeve extending one pipe diameter or 2 inches, whichever is less. The inner diameter of the sleeve to be equal to the outer diameter of the uncoated pipe.
6. The PVC coated GRS conduit, and elbows shall have an interior urethane coating of a nominal thickness of 0.002 inches (2 mils).
7. The PVC coated GRS conduit shall be bendable without damage to the exterior PVC coating and interior urethane coating.

10-3.04 CONDUCTORS, CABLES AND WIRING

Splices shall be insulated by "Method B" except for the 6 No. 16 conductor cable, 40 No. 16 conductor cable, FV cable, 15 kV shielded single conductor power cable, TVL, TVCP, TVC, and 50 No. 19 Shielded twisted pair conductor cable. The 6 No. 16 conductor cable and the 40 No. 16 conductor cable termination shall be environmentally protected,

insulated, and be strain relieved. The FV cable splice shall be covered with a weather resistant device approved by the Engineer. The TVL, TVCP, TVC, and 50 No. 19 shielded twisted pair conductor cable shall not require insulation for these splices. The 15 kV shielded single conductor power cable splice insulation shall be as specified elsewhere in these special provisions for splicing.

The Contractor shall provide the Engineer a Certificate of Compliance from the manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance," of the Standard Specifications for all the conductors and cables furnished for the project.

Section 86-2.09D, "Splicing," of the Standard Specifications is amended by retitling as "Splicing and Terminations," and the last paragraph is amended to read:

All splices and terminal lugs for conductors sized No. 8 and smaller except for the 6 No. 16 conductor cable, FV cable, 40 No. 16 conductor cable, TVL, TVCP, TVC and 50 No. 19 shielded twisted pair conductor cable shall be soldered by the hot iron, pouring or dipping method. Open flame soldering will not be permitted. The 6 No. 16 conductor cable, and the 40 No. 16 conductor cable shall be spliced by using terminators with copper inserts, integral soldering, and flooding compound. The TVL, TVCP, and TVC shall not be splice but have a continue run from the control cabinet to the camera junction box. The 50 No. 19 shielded twisted pair conductor cable shall be splice by installing terminal blocks (Type II) as specified elsewhere in these special provisions inside junction box and connecting the conductors as per the manufacturer's recommendation. The 15 kV shielded single conductor power cable shall be splice by a certified high voltage electrician. The Contractor shall allow 10 working days for approval of the 15 kV splices. The FV cable shall be spliced by using FV cable connectors as specified elsewhere in these special provisions connected between the new and existing FV cable. FV cable splices shall meet the following requirements:

1. Electrical:

Impedance	75 ? nominal
Return loss	30 dB minimum (5 MHz to 300 MHz)

2. Mechanical:

Pulling tension	100 pounds (center conductor) 100 pounds (outer conductor)
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3. Environmental:

Temperature	-10° C to +50° C
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All conductors shall have THWN insulation unless otherwise specified.

40 No. 16 CONDUCTOR CABLE.--The 40 No. 16 conductor cable shall be as specified for 6 No. 16 conductor cable, except that it shall meet the NEMA standards for 40 No. 16 conductor cable construction. The Contractor shall determine the existing cable color code in advance of ordering new cable. Any additional cost in ordering matching color coded cable shall be paid as extra work.

6 No. 16 CONDUCTOR CABLE.--The 6 No. 16 conductors of the cable shall be stranded copper. The insulation of the conductors shall be Type THWN and color coded. The cable shall be assembled with non-hygroscopic fillers and binder tape. The outer jacket shall be black polyethylene. The conductors shall be rated for 600 V and the conductors, and cable shall be suitable for use in wet or dry locations and installation in conduit.

50 No. 19 SHIELDED TWISTED PAIR CONDUCTOR CABLE.--The 50 No. 19 shielded twisted pair conductor cable conductors shall be solid annealed copper. The insulation shall be polyolefin with standard telephone color coding. A non-hygroscopic wrap shall be applied over the cable core. A 1.75 mil copper synthetic polymer back tape (minimum thickness), overlapped to provide 100 percent coverage, and a No. 19 stranded copper drain wire shall be provided. The outer jacket shall be black polyethylene. The cable shall be rated for 300 V, and shall be suitable for wet or dry locations and for installation in conduit.

Unless otherwise specified or shown, at least 9 inches of cable slack shall be left in each junction box and 3 feet of cable slack in each pull box. Cable slack shall be coiled neatly and the bare end of the conductors taped.

SYSTEM GROUND (SG) CABLE.--The system ground cable shall be the same type cable as the existing system ground cable as shown on the plans.

FLEXIBLE VIDEO (FV) CABLE.--The FV cable shall consist of an RG-11/U double foil double braid flexible coaxial cable with a copper clad steel center conductor and shall conform to the following requirements:

Electrical	
Capacitance (picofarads/foot nominal)	16.5
Impedance (? nominal)	75
Velocity of propagation (nominal)	84%
D.C. loop resistance (? /1000 feet @ 20° C)	19.6

Attenuation at 20° C:

Frequency (MHz)	(Nominal dB/100 ft)
5.0	0.27
30	0.67
54	0.90
108	1.30

Physical Specifications	Nominal O.D. (inches)
Center conductor	0.064
Dielectric	0.285
First shield	0.292
First braid	0.317
Second shield	0.321
Second braid	0.346
Flooding compound outer jacket	0.434

Flexible video (FV) cable connectors.--The FV cable connectors shall meet the following requirements:

1. Electrical:

Impedance	75 ? nominal
Return loss	30 dB minimum (5 MHz to 300 MHz)

2. Mechanical:

Type of construction	Integral sleeve
Method of attachment	Connection to outer and center conductors
Composition	Bodies - Aluminum or brass alloy Finish - Chromate conversion, silver plating, or other corrosion resistant metal

3. Environmental:

Temperature	-10° C. to +50° C
Moisture	Weather resistant design

15 kV SHIELDED SINGLE CONDUCTOR POWER CABLE.--The 15 kV shielded single conductor power cable shall be 15 kV rated power cable designed to operate at conductor temperatures of 90° C normal, 130° C, emergency, and 250° C short circuit conditions as defined by ICEA S-68-516 (NEMA WC-8) and Underwriters Laboratories (UL) Standard 1072. The cable shall be suitable for installations above or below grade, indoors or outdoors, and in wet or dry locations. The qualifying cable shall be Underwriters Laboratories (UL) labeled as MV-90, Sunlight Resistant and For CT Use (UL), in accordance with UL Standard 1072. The cable shall consist of the following components:

Conductors.-- The conductors shall be compressed, Class B stranded copper and shall be in accordance with the requirements of ICEA S-68-516. The copper conductors shall consist of all bare strands or tin coated strands in the outer layer in accordance with ASTM B3, B8 and B33.

Conductor shield.-- The conductor shield shall be an extruded, black-colored, non-conducting thermoset material in accordance with Section 2.7 of ICEA S-68-516. The minimum average thickness shall be 18 mils.

Insulation.--The insulation shall be a discharge resistant, ethylene propylene (EP) based compound and be listed by Underwriters Laboratories. The minimum average thickness of the insulation shall be 175 mils. The discharge resistance of the insulation shall be demonstrated by withstanding 21 kV (60 Hz, 25° C, 20 percent R.H.) for 250 hours without failure when tested in accordance with the method described in ASTM D2275-89 "Standard Test Method for Voltage Endurance of Solid Electrical insulating Materials Subjected to Partial Discharges (Corona) on the Surface".

Insulation shielding.--The insulation shielding shall consist of a nonmetallic conducting material extruded directly over the insulation and a 5 mil bare copper tape. The nonmetallic layer shall be black-colored with properties and thickness conforming to the requirements of Table 4a of ICEA S-68-516 and Tables 14.2 and 14.3 of UL-1072. The layer shall be free stripping from the EP insulation. The 5 mil bare copper tape shall be helical applied with a 15 percent overlap, directly over the nonmetallic layer.

Overall jacket.--The overall jacket shall be extruded black-colored Polyvinyl Chloride (PVC) material with physical properties and thickness in accordance with Section 4.4.5 and Table 4-6 of ICEA S-68-516 and shall surface printed as required by UL Standard 1072.

Production testing shall consist of the following.--

1. Continuous DC spark testing of the nonconducting stress control layer prior to extrusion of the EP insulation.
2. Mooney viscosity, scorch viscosity, and specific gravity of each batch of the EP insulation prior to extrusion.
3. AC voltage withstand test for a 5 minute duration, of each finished cable at 35 kV.
4. Volume resistivity of the nonmetallic shield.
5. DC resistance of all insulated conductors and metallic shields.
6. Dimensional verification of all extruded layers.
7. Absence of water in conductors and interfaces confirmed.

CLOSED CIRCUIT TELEVISION CABLES.--Television control (TVC) cable shall consist of 15 No. 18 conductors, unshielded and with an outer jacket. Each conductor shall have a minimum of 16 tinned copper strands with a

minimum of 15 mils insulation. Individual conductor insulation shall be chrome PVC with a nominal thickness of 40 mils. The outside diameter of the jacket shall not exceed 0.55 inch.

Color code for TVC cable shall be:

1. Black
2. White
3. Red
4. Green
5. Orange
6. Blue
7. White/ Black
8. Red/ Black
9. Green/ Black
10. Orange/ Black
11. Blue/ Black
12. Black/ White
13. Red/ White
14. Green/ White
15. Blue/ White

Television power (TVP) conductors shall be 3 No. 14 (120VAC, AC-, equipment ground) individually insulated, stranded copper conductors in conformance with Section 86-2.08 of the Standard Specifications. The conductors shall be color coded black, white, and green respectively.

Television control power (TVCP) cable shall consist of 12 No. 18 conductors, unshielded and with an outer jacket. Each conductor shall have a minimum of 16 tinned copper strands with a minimum of 15 mils insulation. Individual conductor insulation shall be polyvinyl chloride (PVC), rated for 300 V (see color code below). The jacket shall be chrome PVC with a nominal thickness of 40 mils. The outside diameter of the jacket shall not exceed 0.45 inch.

Color code for TVCP cable shall be:

1. Black
2. White
3. Red
4. Green
5. Orange
6. Blue
7. White/ Black
8. Red/ Black
9. Green/ Black
10. Orange/ Black
11. Blue/ Black
12. Black/ White

Television video (TVL) cable shall consist of an RG-6/U coaxial cable. Each cable shall be provided with a solid No. 18 copper clad steel center conductor and shall conform to the following requirements:

Electrical	TVL
Capacitance (picofarads/foot nominal)	16.5
Impedance (? nominal)	75
Velocity of propagation (nominal)	84%
D.C. loop resistance (? /1000 feet)	35.7

Attenuation at 20° C.:

Frequency (MHz)	TVL (Nominal dB/100 feet)
5.0	0.60
30	1.11
108	1.95

Physical Specifications	TVL Nominal O.D. (inches)
Copper-clad steel center conductor	0.040
Foam polyethylene dielectric	0.180
Sealed APA tape with 1/16-inch overlap	0.187
Woven aluminum braid	0.212
Sealed APA tape with 1/16-inch overlap	0.216
Woven aluminum braid	0.241
Flooding compound	
PVC outer jacket	0.297

(APA = Aluminum polyolefin and aluminum with adhesive)

TVL cable shall be terminated with BNC plug connector at both ends.

COAXIAL CABLE CONNECTORS (TVL COAXIAL CABLES).--Coaxial cable connectors for attaching Type TVL coaxial cable shall meet the following requirements:

1. Electrical:

Impedance	75 ? nominal
Return loss	30 dB minimum (5 MHz to 300 MHz)
Rated working voltage	500 V rms

2. Mechanical:

Type of construction	Integral sleeve BNC
Method of attachment	Crimp-crimp
Composition	Bodies - alloy Finish - chromate conversion, silver plating, or other corrosion resistant metal

3. Environmental:

Temperature	-10° C to +50° C
Moisture	Weather resistance design

The mating connector for TVL cable in junction box shall be provided. The center contact of this jack shall be beryllium copper.

TESTING.--Testing of TVL cables and connectors shall be performed in accordance with provisions in Section 86-2.14B, "Field Testing" of the Standard Specifications and these special provisions.

Cable lengths found to have faults shall be replaced and retested. The removed faulty cable shall be disposed of by the Contractor.

Prior to the beginning of work, each length of coaxial cable shall be tested for attenuation and faults to ensure compliance with specifications contained herein using a time domain reflectometer (TDR). For the purpose of these special provisions, a fault in a long length of cable is defined by one or more of the following:

- Return loss measurements indicating that attenuation exceeds 3 dB at 5 MHz to 30 MHz in a portion of cable less than 3 meters long.
- A return loss measurement indicating that there is a short in the cable.
- A return loss measurement indicating a cut or open circuit in the cable.

- d. A visual inspection which reveals exposure of or damage to the cable shielding.

10-3.05 PULL BOXES

Grout shall not be placed in bottom of new or existing pull boxes.

10-3.06 FLASHING BEACONS

All incandescent lamps for flashing beacon units will be State-furnished as provided under "Materials" of these special provisions.

10-3.07 POLYVINYL CHLORIDE COATED GALVANIZED RIGID STEEL CONDUIT BODIES

The polyvinyl chloride (PVC) coated galvanized rigid steel (GRS) conduit bodies shall conform the following requirements before the PVC coating is applied:

1. The PVC-coated galvanized rigid steel conduit bodies shall conform to Federal Specification W-C-586D, and UL Standard No. 514B. The PVC-coated galvanized rigid steel conduit bodies zinc surfaces shall remain intact and undistributed on both the inside and outside throughout the preparation and application processing.
2. The PVC-coated galvanized rigid steel conduit bodies shall be "hot dipped" galvanized inside and out after fabrication with hot dipped galvanized threads. The zinc coating for PVC-coated galvanized rigid steel conduit bodies will be tested in accordance with ASTM Designation: A239.
3. The "hot dipped" galvanized threads, the exterior, and the interior for the PVC-coated galvanized rigid steel conduit bodies shall have an urethane coated of a nominal thickness of 0.002 inches (2 mils).

The PVC-coated galvanized rigid steel conduit bodies shall conform the following requirements when the PVC coating is applied:

1. All PVC-coated galvanized rigid steel conduit bodies shall conform to NEMA standard No. RN-1. The bond between the coatings and the metal shall be greater than the tensile strength of the coatings.
2. All PVC-coated galvanized rigid steel conduit bodies shall have an exterior PVC coating of a minimum thickness of 0.040 inches (40 mils) applied by dipping in liquid plastisol.
3. All hubs on PVC-coated galvanized rigid steel conduit bodies shall have a PVC sleeve extending one pipe diameter or 2 inches, whichever is less. The inner diameter of the sleeve to be equal to the outer diameter of the uncoated pipe.
4. Stainless steel encapsulated screws shall be supplied with all Form 7 and Form 8 PVC-coated galvanized rigid steel conduit bodies.
5. The PVC coating on all Form 8 PVC-coated galvanized rigid steel conduit bodies shall form a gasket-like flange of at least 0.312 inch wide and 0.040 inch thick covering the top of the conduit body around the opening.
6. The PVC coating on all Form 8 conduit body covers shall form a gasket-like flange of at least 0.312 inch wide and 0.040 inch thick covering the bottom of the cover and mating with the flange of the conduit body.
7. All PVC-coated galvanized rigid steel conduit bodies for conduits less than 4 inch shall be Form 7 conduit bodies.

10-3.08 CHANNEL STRUTS AND BRACKETS

CHANNEL STRUT (TYPE I).--The channel strut (Type I) shall be a 12 gauge hot-dipped galvanized (HG) rigid steel strut. The strut shall be coated with zinc after being roll-formed or after all manufacturing operations are completed, conforming to ASTM specification No. A123 or A153.

CHANNEL STRUT (TYPE II).--The channel strut (Type II) shall be a 12 gauge hot-dipped galvanized (HG) rigid steel strut. The strut shall be coated with zinc after being roll-formed or after all manufacturing operations are completed, conforming to ASTM specification No. A123 or A153 and shall have a minimum PVC coating of 20 mil.

CHANNEL STRUT BRACKET.--The channel strut bracket shall be a 12 gauge hot-dipped galvanized (HG) rigid steel bracket. The bracket shall be coated with zinc after being roll-formed or after all manufacturing operations are completed, conforming to ASTM specification No. A123 or A153.

10-3.09 STAINLESS STEEL POWER-STUD ANCHOR-THREADED VERSION

Stainless steel power-stud anchor-threaded version shall have a one piece anchor body with the length identification code. The anchor bodies shall be manufactured from Type 316 stainless steel and shall have an expansion mechanism which consists of a pair of interlocking independent wedges.

Anchor Component	Component Material
Anchor Body	Type 316L stainless steel
Nut	Type 316L stainless steel
Washer	Type 316L stainless steel
Expansion Wedge	Type 316L stainless steel

10-3.10 TERMINAL BLOCKS

TERMINAL BLOCK (TYPE I).--The terminal block (Type I) shall be a single level terminal block. The terminal block shall be rated at 50 A, 600 VAC minimum and shall have a contact resistance of no greater than 0.3 milliohms. The terminal block shall fit a No. 8 AWG wire.

DIN terminal block shall be modular and mount to symmetric rail 35 x 7.5 mm in accordance with DIN EN 50 022. It shall have dead front construction so that the danger of contact with current carrying metal part is eliminated. It shall be capable of terminating bare stripped wire. Use of ring or spade style lugs shall not be allowed. It shall have screws held captive by the current carrying metal body. The screws shall not be held by the insulation housing. It shall be clearly marked with pre-printed markers with its unique circuit number. Its current carrying body shall be manufactured from a minimum of 85 percent copper alloy and nickel plated over 100 percent of their surface areas. It shall incorporate locking screws employing a mechanism such that two thrust member pressure plates wrapped around the screw heads exerts constant friction thereby preventing self-loosing of the wire clamp.

DIN end clamps shall conform to the type of the terminal block installed. It shall be constructed such that the terminal blocks shall not slide off the mounting rail.

DIN partitions shall conform to the type of the terminal block installed. It shall provide both a physical and an electrical separation between terminal blocks.

TERMINAL BLOCK (TYPE II).--The terminal block (Type II) shall conform to the specifications of the terminal block (Type I) as specified elsewhere in these special provisions except that the terminal block shall be a double level terminal block.

TERMINAL BLOCK (TYPE III).--The terminal block (Type III) shall conform to specifications of the terminal block (Type I) as specified elsewhere in these special provisions except that the terminal block shall fit a No. 6 AWG wire.

10-3.11 JUNCTION BOXES, WIRING TROUGH AND BRACKETS

NEMA TYPE 4X CONTINUOUS HINGE JUNCTION BOX.--NEMA Type 4x continuous hinge junction box shall be constructed as follows:

1. Type 5052 H-32 aluminum .080-inch thick.
2. Seams continuously welded and ground smooth, no holes or knockouts.
3. Door and body stiffeners.
4. Rolled lip around three sides of door and all sides of enclosure opening excludes liquids and contaminants.
5. Stainless steel door clamp assembly assures watertight seal.
6. Door is easily removed by pulling stainless steel continuous hinge pin.
7. Data pocket is high impact thermoplastic.
8. Hasp and staple for padlocking.
9. Panel screws are stainless steel.
10. Tapped pads provided for mounting optional panels.
11. Oil-resistant gasket and adhesive.

NEMA TYPE 4X SCREW COVER JUNCTION BOX.--NEMA Type 4x screw cover junction box shall be constructed as follows:

1. Cast aluminum; no welded seams or sharp corners.
2. Captivated cover screws are stainless steel.
3. Cover screws placed outside sealed area.

4. Two to four grounding screws located on enclosure backwall.
5. Oil-resistant O-ring gasket with tongue and groove construction.
6. Threaded internal bosses provided for mounting optional panels, rails and other components.
7. Mounting holes provided in corners outside of gasketed area.
8. Finish similar to ANSI 61 (RAL 7042) gray paint inside and out.
9. Panel is unpainted zinc-plated steel.

NEMA TYPE 3R SCREW COVER JUNCTION BOX.--NEMA Type 3R screw cover junction box shall be constructed as follows:

1. 12 gauge galvanized steel.
2. Drip shield top and seam-free sides, front and back.
3. Slip-on removable cover fastened with stainless steel screws along bottom edge.
4. Door handles.
5. Embossed mounting holes on back of enclosure.
6. No gasketing or knockouts.
7. Provision for padlocking.
8. Finish shall be ANSI 61.

NEMA TYPE 3R WIRING TROUGH.--NEMA Type 3R wiring trough shall be constructed as follows:

1. 14 gauge galvanized steel.
2. Drip shield top and seam-free sides, front, and back protect from rain, snow, or sleet.
3. Slip-on removable cover fastened with captivated stainless steel screws along bottom edge.
4. Embossed mounting holes on back of enclosure.
5. No gasketing or knockouts.
6. Finish shall be ANSI 61.

NEMA TYPE 3R HINGED COVER JUNCTION BOX.--NEMA Type 3R hinged cover junction box shall be constructed as follows:

1. 14 gauge galvanized steel.
2. Drip shield top and seam-free sides, front, and back protect from rain, snow, or sleet.
3. Cover fastened securely with captive stainless steel screws.
4. Hasp and staple provided for padlocking.
5. No gasketing or knockouts.
6. Collar studs provided for mounting optional panels.
7. Finish shall be ANSI 61.

JUNCTION BOX BRACKET.--The junction box bracket shall be a 12 gauge hot-dipped galvanized (HG) rigid steel bracket. The bracket shall be coated with zinc after being roll-formed or after all manufacturing operations are completed, conforming to ASTM specification No. A123 or A153.

10-3.12 REMOVING, REINSTALLING OR SALVAGING ELECTRICAL EQUIPMENT

Salvaged electrical materials shall be hauled to Caltrans Electrical Maintenance Station, 30 Richard Street, San Francisco, CA 94134, phone number (415) 330-6509, and stockpiled. The temporary navigational lighting system and fog bell shall be taken to the San Francisco-Oakland Bay Bridge (SFOBB) electric shop phone number (510) 286-1092 and stored.

The Contractor shall provide equipment, as necessary, to safely unload and stockpile the material. A minimum of two working days notice shall be given prior to delivery.

10-3.13 PAYMENT

The contract lump sum price for electrical facilities (seismic retrofit) shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved in installing electrical facilities (seismic retrofit) complete in place, as shown on the plans, as specified in the Standard Specifications and these special provisions, and as directed by the Engineer.